

PLASTICS

A Periodical Devoted to the Manufacture and Use of Composition Products

BUREAU OF STANDARDS

NOVEMBER, 1928

DEC - 1 1928

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Incorrect and correct use of pre-formed charges.

(Left) Perfect part from adequate charge. (Right) Imperfect part from insufficient charge.

It is bad practice to let a scale stand on the same table used for knocking molds apart.

Charges of Molding Material should be of proper weight

UNDERWEIGHT charges produce defective parts. Overweight charges waste material. An operator should watch his mold charges carefully to make sure that he is getting no defective pieces due to insufficient quantity of material.

All mold charges, whether tablets or powder, measured by automatic weighing machines, should be checked at intervals on a scale. This particularly applies when changing from one run of material to another. If fin proves too heavy reduce quantity until fin of minimum thickness is obtained.

The average measuring scale is a sensitive mechanism easily

thrown out of adjustment, causing inaccuracies in the weights of charges. It should never be allowed to stand on the same table where molds are being knocked apart.

When using pre-forms, especially those made from molding materials of low resin content like the high heat resistant material used for heater plugs, care should be taken in selecting the proper shape for the cavities of the mold being used. While it is not necessary to have it absolutely the shape of the mold cavity, it is well to use oblong and square pieces in oblong or square cavities rather than load an oblong cavity with round pre-forms.

Experience has shown that when using round pre-forms in square or oblong cavities the material will not flow to all parts of the mold causing defective pieces.


Careful adherence to these simple rules will aid in the production of better Bakelite Molded parts. Write for Booklet 51-M, "Bakelite Molded."

This advertisement is the third of a series in which we are featuring a few fundamental rules of plastic molding. Although obvious to many, we find they are frequently overlooked resulting in a loss of both time and money to the molder. By calling attention to some of these simple rudiments Bakelite Corporation hopes to give its customers the benefit of its long experience in its endeavor to advance the art of plastic molding. Enlargements of these advertisements have been made so that they can be placed on the bulletin boards in your Molding Rooms. Copies may be had upon request.

BAKELITE CORPORATION

247 Park Avenue, New York, N. Y. Chicago Office: 635 West 22nd Street
BAKELITE CORPORATION OF CANADA, LTD., 163 Dufferin St., Toronto, Ontario.

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Molded Products See Page 635



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General Plastics, Incorporated, 101 Walck Road, North Tonawanda, N. Y. Also New York City, Chicago, San Francisco.

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in United States



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Aladdinite Co., Inc.
ORANGE, N. J.

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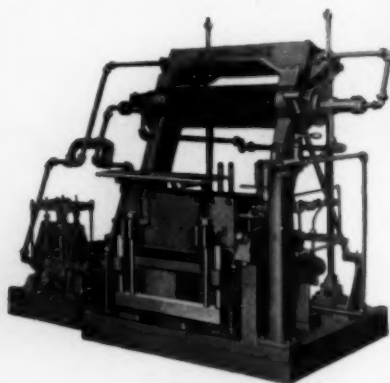
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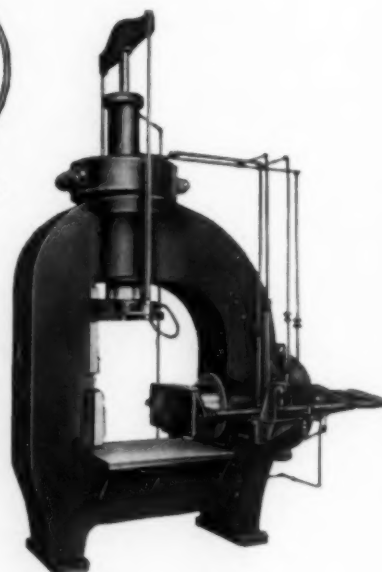
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Angle Moulding Press (Patented)



Angle Moulding Press (Patented)

Rodless Type for Production moulding with direct heated and chilled moulds for moulding pieces requiring split dies.

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WITH this issue *Plastics* enters upon its fourth year. Since it was started in 1925, it has faced the fortunes, good or bad, of the entire industry; it has felt the prosperity or adversity of even the smallest corporation; it has reflected on its pages the personalities of the entire field; yet the future of *Plastics*, close as it is to us, is no closer than the welfare of the industry that supports it.

The impartial attitude mentioned in this column in September has showed us one thing in which we are bigger,—the purpose that inaugurated this periodical, and that has constantly been its sole indication of merit, still maintains the same character. *Plastics* was founded with one aim: To center the relationship of the concerns in the plastic industry by diffusing complete information, by establishing better standards of business, and by suggesting new methods and ideas. We feel obliged to congratulate ourselves in that, in trying to carry out its purpose, *Plastics* has never depreciated the fortunes of its business associates, but has rather built up for itself a good will that is serving to identify the industry.

But the purpose is still far from accomplishment, and for that reason we adopt the following platform, which we will carry out to the best of our combined abilities:

- (1) To encourage and promote any set of practices, made independently or collectively, that will persuade all molders, as well as fabricators, to adopt standard methods of construction and estimating.
- (2) To call to the attention of advertisers any misleading copy, unfounded statements, misuse of public confidence, or any other discrepancy, and to require a complete revision of such copy.
- (3) To take the initiative, whenever possible, in advancing or in exposing new ideas or practices as they may deserve.

The Publishers.

PLASTICS

& MOLDED PRODUCTS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 4

NOVEMBER, 1928

No. 11

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PLASTICS

A periodical devoted to the manufacture
and use of plastic and composition products

Vol. 4

NOVEMBER 1928

No. 11

Japanese Contributions to The Art of Plastics

Oriental chemists and inventors have done much original and valuable research. Use of vegetable proteids such as those from soy beans, corn and the like described

By Charles W. Rivise

B. S. in Chem. Eng., LL. B., M. P. L.

IT has often been charged that the Japanese as a race are merely imitative and not at all original or independently inventive. It has further been stated that Japan owes its recent remarkably rapid progress entirely to its opportunity to borrow what other peoples have worked out for themselves. An unprejudiced study of the Japanese people, however, reveals how unfounded and indefensible these notions are. On the contrary, the Japanese people are decidedly gifted with an uncanny ability to adapt themselves to changed conditions and to adapt means at hand to desired purposes or ends. Moreover, the Japanese mind is unique in its being endowed with a genius for detail—a genius that is reflected in every art and line of endeavor. This is particularly true in chemistry.

Improving on their Teachers

Japanese chemists and research workers were necessarily at first the students of Occidental masters. But from the very first they refused to accept blindly the theories and conclusions of their teachers, how-

The Japanese people, with their gift of adaptability and genius for detail have produced many outstanding scientific workers, of whom a number have contributed to plastics.

Names such as those of Sato, Takamine, Sekine, Itzino, have become known throughout the world. The first especially, has been very active in this field.



Bean Mill worked on Chemical Extraction system in Dairen, Manchuria.

ever generally accepted they were. Instead they checked and rechecked the work of their predecessors as well as contemporaries and did not hesitate to take sharp issue with many of their theories.

The art of synthetic resins offers a striking instance. Baekeland, Aylsworth, Redman and many others had thoroughly in-

vestigated this field and Dr. Baekeland's conclusion that Bakelite was a single compound was generally accepted. Two Japanese workers, Sato and Sekine, however, proved that this was erroneous by separating the phenolic condensation product formed in the presence of an ammoniacal condensing agent into three components by means of the differences in their solubilities.

Resin Investigations

These investigators did not stop at this point. They investigated the nature of Bakelite more thoroughly than had ever been done before and proved that Bakelite had many similar properties with the proteins due to their both being amphoteric. This conclusion enabled them to make a phenolic resin without the use of high pressure which discovery forms the subject matter of Japanese Patents 37,857 and 39,221 (1921).

These workers also classified phenolic condensation products into three groups depending upon their fusibility and solubility and the condensing agents used in their formation. This classification is as follows:

Group	Property	Catalyst or Condensing Agent
1	Fusible & Soluble	Acid
2	Infusible	Ammonia
3	Infusible (highest degree of condensa- tion)	Sodium hydroxide or Sodium sulphate

Sato is the authority for the theory that the fusibility of the phenolic condensation product depends upon the combining capacity of the formaldehyde with phenol, i. e., the number of alcoholic groups present in the oily product. If there are few or no alcoholic groups present, the resin will be fusible; if there are many such groups an infusible product will be found.



Coolies at Newchwang, Manchuria, carrying soy beans from the junks to the large stacks

Among the many Japanese patents secured by Sato is Patent 39,320 (1921) in which the oily condensation product of phenol and formaldehyde made in the presence of sodium sulphite is treated with a metallic salt such as copper sulphate, nickel sulphate, zinc chloride, calcium chloride, aluminum hydroxide or cupric hydroxide, to form a Bakelite substitute.

Sato is probably best known in this country on account of his work with proteids and proteins. Seventeen patents have been issued to him by the United States Patent Office on plastics made from the vegetable proteids derived from soja bean, wheat, corn, lentils, peas, cereals, etc.

In Patents 1,275,308; 1,321,479; 1,321,480 and 1,427,645 soja bean or other proteid containing substance is dried in a revolving cylinder and then flattened by being passed through rollers. This is done to facili-

tate the removal of the outer skin of the material and the extraction of the oil which may be accomplished by means of an oil solvent such as benzene. The oil may then be removed by agitating the material and circulating dry air of moderate temperature or vacuum through the mass contained in cylinders.

The meal thus obtained is treated with water to extract the saccharocolloids, fiber and the colloids by forming suspensions or colloids therewith. The liquid is separated from the mass and is then precipitated by means of a ferment such as lactic or acetic ferment.

Before precipitation the liquid may be further purified. This may be accomplished by adding caustic or carbonated alkali or ammonia to dissolve the suspensions or proteids and then separating the liquid by mechanical, physico-chemical, or chemical means. The mechanical means may be filtration or centrifuging and the physico-chemical means may be fractional precipitation or fractional solution of the precipitated impure proteids.

The precipitated mass is pressed into cakes and may be dried and powdered. The product which is known as refined proteid is said to be white in color, tasteless, odorless and plastic. It is, furthermore sticky when kneaded in wet condition. After drying the product is not sticky even when kneaded with water unless a proteid solvent such as an alkali or acid is added. When dissolved in suitable solvents it forms

derivatives which are flexible, elastic, adhesive, tough and strong and which do not crack when drying. The product is said to be especially suitable as a food material or as a component of food material, or for the manufacture of non-inflammable celluloid substitute, lacquer, varnish, rubber substitute, leather or linoleum substitute.

In Patent 1,275,324 issued August 13, 1918 to Sato and Takamine, the method of Patent 1,275,308 is especially adapted to obtaining proteid matter from corn. The corn is steeped in water containing a suitable antiseptic such as sulphurous acid to cause the grains to swell up. The swelled grains are broken by means of a crushing mill and the germs carrying the oil are separated by agitating the mass with water. The resulting mass is then bolted through a bolting cloth or silk to remove the bran. The liquid is treated to separate the starch and proteids of the corn grains and the proteid meal is caused to settle to the bottom by allowing the resulting liquid to stand. The proteid meal may be refined as in Patent 1,275,308, the precipitation being accomplished by means of a ferment or by means of an acid such as sulphuric, sulphurous, acetic, or



A fleet of junks engaged in carrying soy beans to Newchwang, Manchuria, from the interior.

phosphoric. A variation is to treat the proteid meal before purification with an aqueous salt solution such as sodium chloride or ammonium sulphate.

In Patent 1,245,975 dated November 6, 1917, Sato kneads the refined proteid obtained according to the patents previously discussed with a dilute alkali or with a compound that reacts alkaline in solution to form a complex salt. The alkaline reacting substance may be caustic soda, lime, sulphides, borates such as borax, silicates, carbonates, phosphates, sulphites, formates, acetates such as sodium acetate or any organic acid salt of alkali, metals or ammonia, or organic bases such as pyridin, urea, glycerin or other amino compound. The product gelatinizes and becomes more and more sticky and transparent until it becomes a semi-transparent elastic mass. When dried it becomes transparent and may be molded in any desired form. After molding it may be immersed in formaldehyde.

With Cellulose Compounds

A variation is to treat the complex salt before molding with a condensing agent such as tannin, hexamethylenetetramine, trioxymethylene, aldehydes or other active methylene compounds. Pigments or coloring materials as well as organic or inorganic fillers may be kneaded into the product. Among the fillers mentioned are hydrocellulose, oxy-cellulose and cellulose esters.

The finished product is said to be a celluloid-like substance which is non-inflammable and water and acid proof. It is a good electrical insulator and may be used as a substitute for ebonite, celluloid, Bakelite, ivory or marble.

The process just considered is based upon the fact that proteids possess amphoteric properties owing to the presence of both carboxyl and amino groups. For example glycinin which comprises the chief constituent of soja beans has strong acid properties due to the predominance of carboxyl groups over amino groups. It would also be expected that the proteids including glycinin, legumin, gliadin, phaseolin and zein would al-

so combine with acids. In fact Patents 1,245,976 dated Nov. 6, 1917 is based upon this property.

In this patent refined proteid is kneaded with an acidic glutinizing agent instead of with an alkaline reacting substance as in Patent 1,245,975. In all other essentials the methods are substantially similar. The glutinizing agent may be (1) an inorganic acid such as phosphoric or sulphurous; (2) a fatty or ox-fatty acid such as formic, acetic, propionic, phenyl-propionic, malonic, lactic, tartaric, citric or malic; (3) an aromatic acid such as salicylic or benzoic; or (4) phenols such as carbolic acid, cresol, resorcin and nitro-cresol.



Increase in volume of soy beans caused by soaking. Each pile contains the same number of beans.

The degree of flexibility, elasticity, hardness and transparency of the product may be varied and controlled by varying the amount of acid used.

In Patent 1,245,977 the plastic composition made with either an acidic or alkaline glutinizing agent and with or without a methylene condensing agent is adapted for use in making an artificial leather. Preferably a sticky or viscid substance such as oxidized oil such as castor oil or triphenyl glycerine or a viscous plastic substance such as hydro-cellulose, oxy-cellulose or cellulose esters is added to the mass. The usual pigments or coloring materials as well as fillers such as waste hemp, cotton, wood fiber, paper, leather waste or other fibrous material may be added. A small amount of alkali such as caustic soda may also be added.

The product may be rolled into sheets or applied to any suitable cloth or fabric.

The material of this patent is adapted to be made into a linoleum substitute by incorporating cork powder or sawdust or both. This variation forms the subject matter of Patent 1,245,978. The composition may also be adapted for use as a rubber substitute by increasing a vulcanized oil such as castor oil, soja bean oil or corn oil according to Patent 1,245,979.

Phenol and Proteids

In Patent 1,245,980 a refined proteid is glutinized with a phenol such as carbolic acid or cresol and then treated with a condensing agent such as formaldehyde, trioxymethylene or hexamethylenetetramine to form an insulating material that is said to be unaffected by water, acids, alkalis, organic solvents, heat, cold, weather or electricity. Any suitable pigment or aniline dye may be incorporated in the mass which may be molded into sheet form, insulating strips, washers or boards.

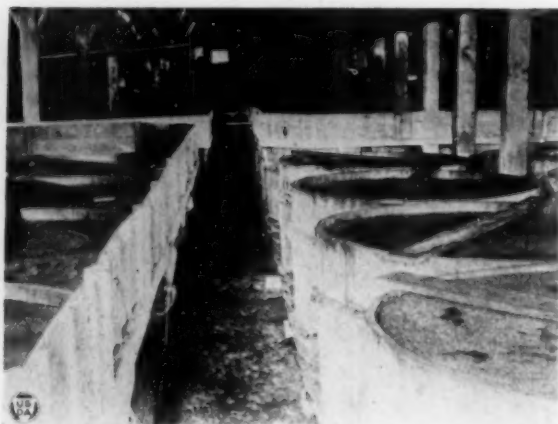
This compound may be mixed with nitrobenzol, aniline carbon tetrachloride, chloroform or oleis acid and used as a lacquer or cement according to Patent 1,245,981. The coating may be applied to stone or concrete to produce facing tile or ornamental cornices, or to glass to produce stained glass effects. Fibrous material saturated therewith may be used in electrical insulation.

Coating Compositions

Patent 1,245,982 is specific to products made by coating bodies such as tile, brick, glass, china, earthenware, etc. with the lacquer made as in Patent 1,245,981. The coating may be applied in any suitable manner as by immersing the article in the liquid or by means of a brush. If the article is porous, as in the case of brick or cement blocks, the surface should have an undercoating applied thereto, as for example, starch paste

with some earthy matter. Materials such as glass or china do not require an undercoating.

In the case of bricks, cement tiles, blocks or paper board it is desirable to remove the air contained in the body in order to



Tubs of soy bean mash in Japan, showing beans floating on the surface.

obtain thorough impregnation. This may be done by means of a vacuum.

Beautiful ornamental effects may be obtained by applying differently colored coatings to different parts of the surface, or in any desired outline, ornamental design, picture or scene to give the effects of ornamental stained glass. The surface of the article is said to be lustrous and unaffected by water, acid, alkali, heat, cold, weather variations or the ordinary organic solvents.

In Patent 1,245,983 a refined or unrefined proteid is treated with a material which reacts with formaldehyde to produce an oxymethane compound, for example a mixed solution of concentrated sulphurous acid and formaldehyde. The mixture forms oxymethanesulphonic acid and may be replaced with a mixture of sodium sulphite and formaldehyde. The oxymethane-sulphonic compound is said to act both as a glutinizing agent and a condensing agent. The same coloring materials, fillers and viscous plastic substances may be incorporated as in the patents already discussed. The product may be molded and then dried, the condensation taking place during drying.

In Patent 1,245,984, Sato sug-

gests utilizing the proteidal residue or waste heretofore discarded as a filler for the proteidal condensation product alone or in conjunction with the other fillers and coloring materials. The product may be used for linoleum, wood carpet, floor covering, tile, rubber substitute, or celluloid substitute.

Patent 1,280,861 discloses a transparent varnish for wood or metal made by glutinizing proteids. Acidic or basic glutinizing agents or mixtures of several basic or several acidic glutinizing agents may be used. To increase the durabi-

lity and other qualities of the varnish, the glutinized mass should be also condensed with a methylene compound such as formaldehyde.

Patent 1,280,862 suggests hydrolyzing the proteidal material before treating it with the glutinizing and condensing agents. The hydrolyzation may be carried out by physical or chemical methods. The physical methods may consist in subjecting the material to superheated steam, heat or to room temperature for a long time. Chemical hydrolysis may be affected by means of an enzyme, by warming with an alkali or an acid, or by exposure to wet sulphur dioxide or hydrochloric acid gas or by immersing in alcohols.

(Continued on page 634)

Most Commonly Used Solvents and Cellulose Ester Plasticizers

(Continued from September, p. 505)

Resume of High Boiling Esters, Acid-amides and Anilides employed as Cellulose Ester Solvents and Plasticizers

Scientific name	Mol. wt.	Condition at Room Temp.	Esterification number (Saponification number)
Methyl glycol acetate	118	fluid	474
Ethyl glycol acetate	132	fluid	424
Diethyl carbonate	118	fluid	949
Ethylbutyl carbonate	146	fluid	767
Butyl acetate	116	fluid	483
Cyclohexyl acetate	142	fluid	394
Methylcyclohexyl acetate	156	fluid	359
Butyl benzoate	178	fluid	315
Amyl benzoate	192	fluid	292
Benzyl benzoate	212	fluid	264
Methyl phthalate	194	fluid	577
Ethyl phthalate	222	fluid	504
Butyl phthalate	278	fluid	403
iso-Butyl phthalate	278	fluid	403
Cyclohexyl phthalate	330	fluid	339
Methylcyclohexyl phthalate	358	fluid	313
Amyl phthalate	306	fluid	366
Benzyl phthalate	346	fluid	324
Methylglycol phthalate	282	fluid	397
Ethylglycol phthalate	310	m. p. 33°C.	361
Triphenyl phosphate	326	m. p. 45°C.	515
Tricresyl phosphate	368	fluid	456
Benzenesulfonamide	157	m. p. 156°C.	713
para-Toluenesulfonamide	171	m. p. 137°C.	655
Acetanilid	135	m. p. 115°C.
Methyl acetanilid	149	m. p. 101°C.
Ethyl acetanilid	163	m. p. 52°C.
Oxanilid	240	m. p. 245°C.
Methyl para-toluenesulfonate	186	fluid	301
Ethyl p-toluenesulfonate	200	m. p. 32°C.	280
Cresyl p-toluenesulfonate	262	fluid	214
Methyl adipate	174	fluid	644
Ethyl adipate	202	fluid	554
Butyl adipate	258	fluid	434
Amyl adipate	286	fluid	391
Cyclohexyl adipate	310	m. p. 38°C.	361
Methylcyclohexyl adipate	338	fluid	331
Benzyl adipate	326	fluid	344

Shellac-like Products Obtainable From Rubber

Softening gradually when heated, and free from sulphur, these products present interesting possibilities for quick molding

IN the August issue of PLASTICS (page 453) we promised a continuation of this article. We had been discussing the patents of Harry L. Fisher, assignor to the Goodrich Co., and especially his U. S. P. 1,668,235; May 1, 1928, and had described a balata-like rubber and para-toluene sulfonic acid. We now continue from that point by describing shellac-like products made by Fisher according to the same patent.

As an example of the third or shellac type of product, large masses of the above described mixture of rubber and organic sulfonic acid are placed in a container and heated for 3 to 4 hours at 130° C. After about one hour the temperature within the mass rises to 200-400° C. or higher, the mass melts and bubbles of gas are given off. The weight loss may be 3 to 4% or higher. This method of heating leaves a superficial layer of the balata-like product surrounding the fused material, apparently due to radiation of heat. This may be avoided by heating the mass at the beginning to 200-210° C. for a shorter period of time.

The fusible, hard, brittle, shellac-like product dissolves to a colloidal solution in benzene, p-cymene, gasoline, turpentine, "tetralin", "decalin", chloroform, carbon tetrachloride, carbon bisulfide and molten camphor, but is practically insoluble in alcohol, ether, acetone, glacial acetic acid, amylacetate, aniline,

The products described are derived from rubber that has been treated with organic sulfonic acids as well as with sulfuric acids and demonstrate that much may yet be learned on the subject of the utilization of caoutchouc.

These materials are in active competition with the wholly synthetic products, and at the present price of rubber are very interesting.

water, dilute acids and alkalis. When its solutions are filtered to remove small amounts of impurities and the filtrate poured into alcohol, acetone or similar liquid, there is precipitated a whitish powder having all the properties of the original material and which on fusing gives an amber-colored, translucent product which has practically no sulfur content. This product softens at 90-100° C., slowly melts at 110-120° C., and is completely fused at 125-130° C. such gradation of softening under heat making it similar to shellac and making it exceptionally valuable for uses similar to those of shellac. Inert fillers may be admixed either before or after the heat treatment. Such pigments as zinc oxide, which react with sulfonic acids, may be admixed after the reaction is completed. The shellac-like product may be hot-molded with a high polish

and is stable under atmospheric conditions. It is slowly attacked by concentrated sulfuric acid and is nitrated by strong nitric acid similarly to the original rubber from which it was prepared.

The products above described possess exceptional dielectric properties thus providing a new group of compositions, of value for the several uses above described as well as other uses which will occur to those skilled in the art.

His next patent, U. S. P. 1,668,236, May 1, 1928 relates to compositions of matter made from or containing rubber, and more specifically to the treatment of rubber with sulphuric acid and products so formed.

Heretofore, sulphuric acid has been caused to react upon rubber only in such large proportion of the acid as to produce a hard, granular, material having a high heat softening point, the reaction being comparable in this respect to the vulcanization of rubber with large amounts of sulphur to produce ebonite, and said granular material has required to be subjected to a high degree of heat or pressure to produce a cohesive mass.

By mixing with rubber much smaller amounts of sulphuric acid than have heretofore been used, and heating the mixture, there is obtained a tough, highly heat-plastic product well suited for the manufacture of molded articles and other uses, the heat softening point being comparatively low.

By way of example, 5 parts by weight of concentrated sulphuric acid, specific gravity 1.84, are diluted with 1.25 parts of water and made into a paste with 2 parts of a material substantially inert to the acid, such as fossil flour or titanium oxide. This paste is then milled into 100 parts by weight of rubber, keeping the mill rolls as cold as possible. The water serves to delay the primary reaction of the acid and rubber, thereby permitting the acid to be well disseminated in the rubber before the primary reaction begins. The pigment facilitates the handling of the acid and also hastens the mixing of the acid with the rubber. The rubber is then sheeted out in sheets from $\frac{1}{2}$ to 1 inch in thickness and heated for 15 to 20 hours at 125° C. to 130° C. The product is a hard, tough, thermo-plastic material which can be milled on a hot mill or otherwise manipulated for such purposes as the impregnation of fabric or the manufacture of molded goods.

This thermo-plastic material is also characterized by its high dielectric strength and by its susceptibility of being crushed at ordinary temperatures for molding of the crushed product, and of being re-milled at temperatures ranging from 30 to 70 pounds steam pressure. The material may be mixed with crude rubber or other plastics by milling, or may be compounded with fillers, pigments or colors.

Fisher's third patent, U. S. Patent 1,668,237, May 1, 1928, describes a method in which rubber is treated with sulfuric acid and various organic reagents. For instance the reaction products of rubber with sulfonic acids and sulfonyl chlorides are described as heat plastic compositions having when heated a gradual transition from the solid to the liquid state without a sharp melting point, being in this as well as in other ways similar to shellac.

Such sulfonic acid or sulfonyl chloride derivatives of rubber may be mixed with the proper

fillers, stiffeners or lubricants and molded to form articles such as phonograph records, the rubber derivatives replacing shellac for this purpose. I find that in some instances record tablets so prepared, however, have a surface tack and tend to adhere to the fingers. By preparation of the rubber plastics at various temperatures or with varying amounts of reagent, the physical properties may be varied to avoid tackiness, but thereby the plastic may attain such a high softening point as to make it unsuitable for record molding or it may be so resilient that it will not grind to a powder and cannot be properly mixed with the necessary ingredients.

The general object of Fisher's third invention is to provide heat-plastic derivatives of rubber, such, for example, as will be suitable for use as shellac substitutes in molded compositions. By the use of sulfuric acid alone it has not been possible to prepare a shellac-like derivative of rubber, while the sulfonic acid and the sulfonyl chloride products have certain disadvantages as above stated, but by the combined use of sulfuric acid and a sulfonic acid or a sulfonyl chloride there may be produced a product of exceptional value as a shellac substitute or plastic.

(Continued on page 629)

Disastrous Pyroxylin Blast Kills Fifteen Persons East Lynn, Mass., Plant Wrecked

CARELESSNESS of some kind in the handling of pyroxylin scrap, from which box toes are made, proved once more that one can not be too careful. Pyroxylin products are valuable and safe, provided the users will exercise common sense and reasonable precautions.

Lynn, Mass., Nov. 8—(Associated Press) — Fifteen persons were killed and at least twenty injured, nine of them seriously, in an explosion which wrecked the shoe plant of the Preble Box Toe company in East Lynn shortly after the plant opened for business today. The building was immediately enveloped in flames.

Of the bodies recovered, four were those of occupants of a dwelling close to the factory—a mother and three of her eight children. The others killed were believed to be factory employees.

Smothered by Flame

The woman was Mrs. Harry Blaney. She and her husband with all their children were at the breakfast table when the explosion came. Instantly a sheet

of flame leaped from the factory twenty feet to their home, bursting through a window and enveloping the family. Mrs. Blaney and three of the children were burned and smothered to death. The others in the family escaped with comparatively minor injuries.

There was a series of explosions in a pyroxylin plastic mixture used in the manufacture of box toes for shoes. The first came at about 7:35 o'clock. Half a minute later there was another and later there were two or three minor explosions.

Flames Scorch Near-By Places

One end of the one-story concrete block building was blown out and two bodies were hurled into the street with it. The flames which followed the explosions scorched many nearby buildings and the heat and the force of the explosions broke a large number of windows.

The entire fire department was called to the scene. What caused the first explosion had not been determined. In the confusion no one could be found who knew just how many persons were employed in the factory.



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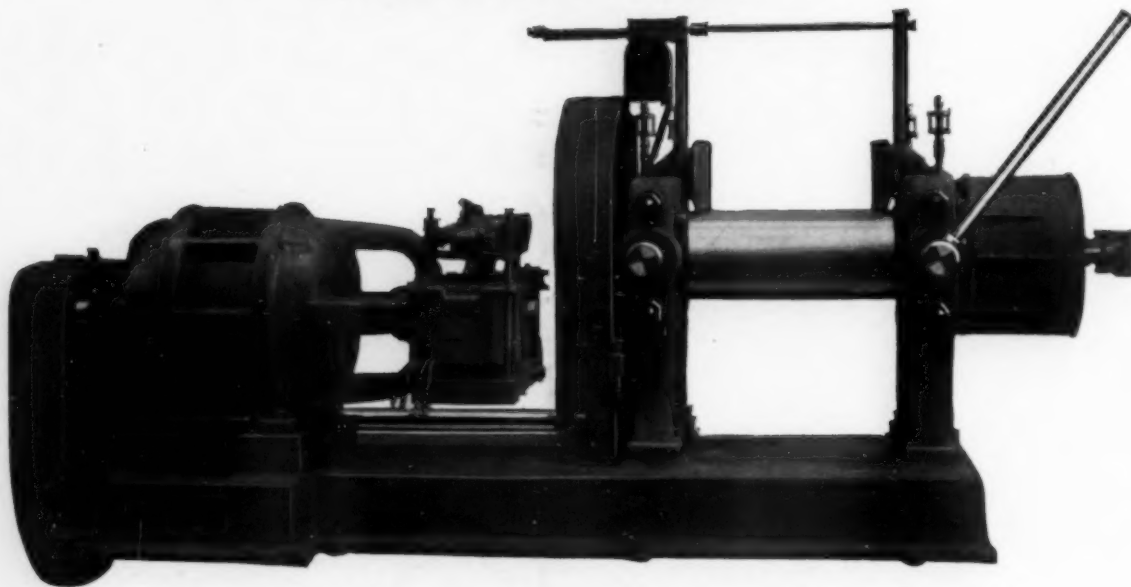
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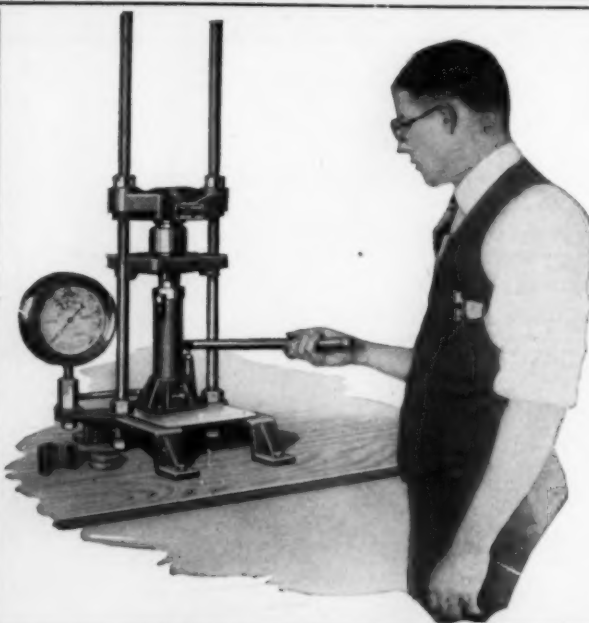
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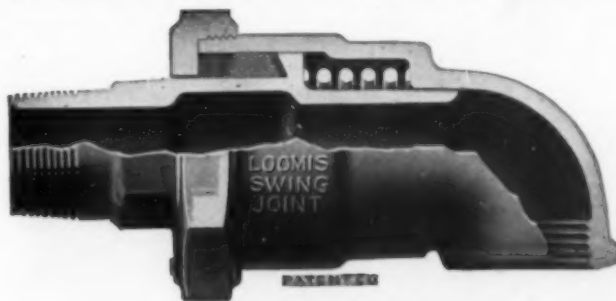
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Further Recent Progress In the Production of Resinoids

Patents show great interest in and progress being made in this field

By Carl Marx

THE following constitutes the completion of a review of the more interesting recent patents in the preparation of various types of resins. The series of articles began in September and is now continued from page 567 of the October issue.

The next patent to be considered is:—

1,669,831. May 15, 1928. Carl Kulas, Leipzig, Germany. Method of Producing Artificial Resin.

Continuous processes for making the various resins seem to be attracting considerable attention. This patent relates to a process for producing a phenol-aldehyde or similar resin, of the fusible shellac-like type, by employing suitable mechanical devices and operations to permit continuous operation. For example the initial condensation stage is carried out in the usual type of still until separation into two layers takes place. The liquids are then drained into separate tanks and then pass into a centrifugal separator so as to remove the water and other reaction products that are in liquid form from the resin. The resin thus separated passes to a drum that is internally heated and the resin is picked up on the outside of the drum, which slowly revolves, a doctor blade serving to control the thickness of the resin on the drum. The heat acting on the resin during the slow rotation of the drum causes the action to become complete and further removes water etc. The resin is stripped from the heated drum and at once transferred to a similar drum, which however is cooled, so that the resin will set thereon to a

brittle mass which is stripped from the drum in the form of flakes ready for shipment. If a B-stage (resitol) is to be made, several successive heated drums may be used. Methods for recovering the resin that settles out from the aqueous upper layers, and combining the same with subsequent batches are also described. The process is not limited to any particular type or composition of resins.

Rubber Like Materials

The next two patents that come under discussion relate to materials having either the property of hard rubber or by suitable modifications of the process lead to soft elastic masses much like vulcanized rubber. They are made from vinyl alcohol.

1,672,156 and 1,672,157. June 5, 1928. Dr. Willy O. Herrmann and Dr. Wolfram Haehnel, assignors to Consortium für Elektrochemische Industrie, of Munich, Germany. Process for producing Polymerized Alcohol and Rubberlike Products.

Vinyl alcohol, which is an isomer of acetaldehyde, is an unstable substance and can therefore be obtained in the pure form only with considerable difficulty. However, when polymerized into a form corresponding to the formula $(CH_2:CHOH)^n$ a product is obtained that lends itself to controllable further polymerization and condensation, leading to resinous or rubber-like products. For example 60 grams of potassium hydroxide are dissolved in 50 grams of ethyl alcohol in a vessel equipped with a stirrer. To this solution are added with thorough agitation 80 grams of ground polymerized vinyl ace-

tate. After agitating for about half an hour the precipitated polymer of vinyl alcohol separates as a powdery precipitate, which is filtered off and dried. This material is water-soluble and evaporation of such solutions leaves films or sheets of extreme elasticity and strength. From this polymerized vinyl alcohol product, according to the second patent, the rubber-like materials are prepared. For example the product prepared as above described is mixed with 1% of sulfur and treated for 5 hours at 150°C under 10 atmospheres pressure. A black hard-rubber-like product results. This can be cut and worked like hard rubber. Use of a solution of sulfur monochloride in carbon disulfide, acting in the cold, leads to a soft rubberlike composition. Several applications of a number of similar products to the formation of plastics are described.

Aminoplastics

The last patents to be discussed in our present review of the latest patent developments in the resinoid art are both the inventions of Dr. Felix Lauter, of Philadelphia. It will be recalled that Dr. Lauter was the assignee of the Johns patent on urea-formaldehyde resins, and he has been very active in this field, having produced an early urea-formaldehyde product known as "Crystallite". The patents are assigned to Rohm & Haas of Philadelphia. They cover:

1,671,596. May 29, 1928 and 1,672,848; June 5, 1928. Felix Lauter, assignor to Rohm & Haas, Philadelphia, Pa. Resinous Reaction Product of Urea and Formaldehyde. The first patent is aimed at the production of entirely transparent glass-clear condensation products. Lauter has found that the cloudiness found in the usual urea-formaldehyde condensation products is due to methylene urea, a crystalline non-resinous substance. The formation of this is avoided by carrying out the condensation as follows: to a boiling solution of formaldehyde a heated solution

(Continued on page 633)

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Composite Molded Mica Products

The American Patent History of an Active and Highly Useful Art. The Materials find Widespread and Important Applications

By Joseph Rossman

B. S. in Chem. Eng., LL.B., M.P.L., M.A.

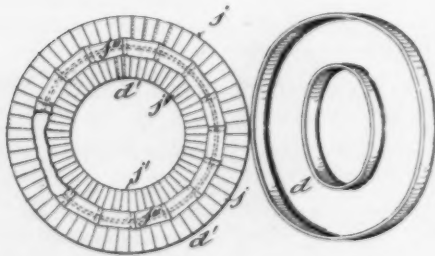
CONTINUING from the October issue (page 574) we now come to the patents on composite molded mica products from 1894 forward.

8. Dyer 483,646, October 4, 1892.

The method of manufacturing electrical insulating mica sheets, the same consisting in varnishing a large sheet of iron or similar foundation-plate and placing thereon a series of smaller mica scales with their edges overlapping each other, varnishing the layer of scales and applying a second series of smaller sheets with their edges overlapping, continuing in the same manner until a plate of the required thickness is formed, heating the sheet to partially evaporate the solvent of the varnish, rolling the same to remove the excess of the varnish, subjecting the sheet to a heavy pressure, and finally cooling it.

9. Jefferson 483,653, October 4, 1892.

The process of bending and setting mica sheets, consisting



Initial and final stages of built up mica ring made according to U. S. P. 483,653.

in building a mica sheet by cementing together laminae of mica scales with overlapping

In keeping with our policy of bringing to our readers both the latest developments in the plastics field, as well as comprehensive reviews of the special arts relating to this industry so that many a weary hour of searching may be spared the investigator, we are continuing herewith the interesting compilation prepared by Mr. Rossman.

As our readers probably already know he is a chemist, and master of patent law, and, through his experience in the patent office well qualified to prepare these digests.

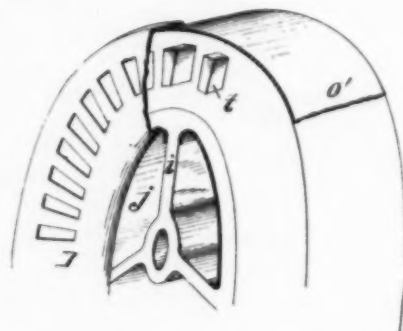
edges, compressing the sheet into the desired form while the cement is wet, drying the cement by evaporating the solvent thereof, and finally chilling the molded mica sheet while under compression.

10. Jefferson 491,707, February 14, 1893.

An electrical insulating conduit consisting of strips of series of joined mica scales wound helically upon one another in layers and having their edges overlapping one another.

11. Jefferson 491,708, February 14, 1893.

An annular disk for insulating armature head, consisting of laminae of annular disks each of which consists of the combination of concentric rings formed of mica with their edges overlapping and cemented together and a ring of mica scales overlapping and cemented to one another and to said first named rings.



Dynamo and motor mica insulator as shown in U. S. P. 491,708 just above.

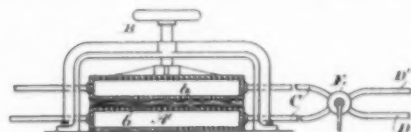
12. Jefferson 497,324, May 16, 1893.

The process of manufacturing a mica plate, from mica sheets and cement consisting in distributing the sheets evenly upon and within the cement while in a liquid condition, by the action of the gravitation and resistance of a fluid during the fall of said sheets through the fluid from such a height above the cement that the sheets become substantially parallel to a horizontal plane before reaching the cement, expelling the excess of cement by pressure, drying the plate thus formed, and finally grinding the surfaces of the plate until opposite sides are substantially parallel. The cement used for making these

mica plates varies of course according for what purpose the plates are going to be used. For electrical purposes shellac or other high resistance gum is suggested. For fireproof purposes silicate of soda, Portland cement, etc., or a thin solution of clay which in that case would require the plates to be burned in a kiln like brick and tile. These various plates, slabs, etc., have also value for decorating purposes, and can be used for building, roofing or wherever a waterproof, fireproof and refractory material is required.

13. Tinnerholm and Peterson 522,242, July 3, 1894.

The process of building up mica plates, which consists in forming superposed layers of



Simple steam heated press formerly used in molding the mica plates as shown in U. S. P. 522,242.

mica scales covered with finely powdered gum or resin, submitting the layers thus assembled to heat and to pressure applied at right angles to their plane, and maintaining the pressure until the material is cooled.

14. Peterson 549,254, November 5, 1895.

The method of forming flanged insulator rings of built-up pieces of mica, which consists in bending pieces of mica, assembling them to form a predetermined shape, cementing them together as the irregular structure is built up, subjecting said structure to pressure and heat, and chilling the same.

15. Pratt 551,230, December 10, 1895.

To form an insulating composition a suitable quantity of rubber, or other vulcanizable gum, and sulphur, or other vulcanizing agent is dissolved in naphtha or a similar vehicle, and this pasty liquid is thoroughly mixed and incorporated with an amount of mica in a finely divided, laminated, or comminuted state. The mica in this state mixes easily with the gum,

having smooth and glassy faces and sharp edges it works into the gum. Into this is put an amount of asbestos fibers, preferably about equal to the quantity of mica, the fibers first having been combed to remove all of the metallic dust and granules. This mass is then stirred, so that these fibers twist and wrap themselves about the particles of mica and firmly hold them together. The mica being somewhat slippery easily works its way among the fibers. The composition is then molded into the desired form and hardened by heat and pressure, the particles of mica slipping around in the mold under the pressure and filling out all the corners square and true. As the composition is vulcanized and dried the fibers shrink and tightly hold the mica particles together, while the gum readily adheres to the fibers and binds them together, forming a piece of great hardness and tensile strength. As the mica and the asbestos are each excellent non-conductors of both heat and electricity the composition forms an insulator of high resistance, and as the mica is cheaper and more easily molded than the fibers the composition can be shaped into various forms and will finish with sharp and even edges, very desirable insulating pieces can be formed for dynamos, which possess great strength and tenacity as well as being cheap.

16. Jefferson 563,379, July 7, 1896.

An electric insulator, in sheet form, consisting of a fibrous sheet, a gutta-percha tissue held thereon by adhesion, mica scales held to the gutta-percha tissue by adhesion, a second sheet of gutta-percha tissue upon the mica, a second sheet of fibrous material upon the gutta-percha tissue, and so on, in the same order to any desired thickness.

17. Jefferson 563,719, July 7, 1896.

A layer of paper is taken, and upon this is placed the gutta-percha tissue in the condition in which it is bought on the mar-

ket. Upon the gutta-percha tissue are laid by hand or by any convenient tool pieces of waste mica having dimensions of from one by two or two by three inches, etc., but generally of about these dimensions. They are laid with their edges abutting or overlapping one another. Upon the mica is put another sheet of gutta-percha tissue as before, and upon this a further thin sheet of asbestos, for example, as it comes in the market, in appearance, to a great extent, like a sheet of cloth or paper. Next comes a sheet of gutta-percha tissue and then the paper. Next comes a sheet of gutta-percha tissue and then the paper. In order to make the gutta-percha tissue adhesive and thereby form a cement, it is heated to a temperature below its kindling point and also below that temperature at which it might become changed as to its chemical nature. While it is in a heated condition the whole sheet is subjected to heavy pressure in order to form close contact and to drive out occluded gases. When the sheet becomes cool, it is ready for use.

18. Heard and Snyder 686,930, November 19, 1901.

The method of making mica sheets which consists in applying a binder to a moving surface as a drum, blowing mica scales or sheets across the prepared surface, heating said surface, thereby lessening the adhesion of the binder thereto, bringing the film thus formed in contact with a cooler adherent surface and separating said surfaces, whereby the film is transferred from one surface to the other.

19. Jefferson 687,531, November 26, 1901.

Insulating material consisting of oxidized linseed-oil, and layers of mica scales, said oxidized oil forming a substantial part of the body of the insulating material, and uniting said scales to form a solid mass with the same.

20. Jefferson 687,532, November 26, 1901.

The method of manufacturing insulating material, consisting

in first applying a layer of mica scales to a layer of a pliable adhesive substance in a liquid, semi-liquid or plastic state, next applying a light pressure to the sheet so formed sufficient to smooth out the layers and to expell the gas, but without squeezing out the adhesive substance, then drying it, and then baking it, then coating said baked sheet with said liquid or semiliquid substance, then drying said coated sheet, thereby forming a pliable insulating-sheet with the mica scales and adhesive substance united in a solid mass.

21. Raphael and Elias 691,871, January 28, 1902.

The process of producing an insulating packing material composed of asbestos and mica, consisting in moistening the asbestos with water and pressing the mica and asbestos together.

22. Jefferson 764,810, July 12, 1904.

The method of treating scales or pieces of mica or similar material to prepare them for adhesive union with each other or with other articles, consisting in laying said pieces on an open-work support, passing the support bearing the separated pieces under a falling adhesive substance through a heated area, whereby the surface of each piece may be independently covered with adhesive material, and said material melted and thus caused to adhere to said surface.

23. Jefferson 764,812, July 12, 1904.

A separate scale of mica toughened by a coating of a dried adhesive insulating substance capable of being softened, and said scale adapted to be used as a unit in building up an insulator.

24. Cooper 847,910, March 19, 1907.

The process of making laminated mica sheets which consists in first immersing the scales in a cement bath, then draining the so immersed scales and arranging several thicknesses thereof in one operation on a perforated supporting base, placing another

layer of scales over the spaces of said first layer to break joint therewith, then tilting said perforated support into position to permit light to shine through thin or weak places in the sheet being formed and then placing reinforcing scales over the weak places so discovered.

25. Haefely 858,285, July 2, 1907.

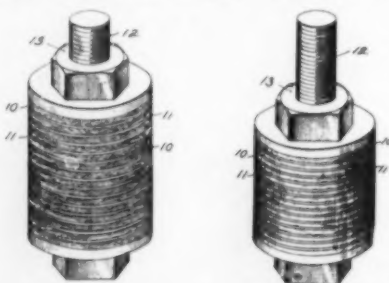
The method of making an insulating tube which consists in winding a sheet of varnish-coated fibrous material and a superposed layer of mica upon a mandrel and simultaneously pressing the tube against a plurality of heated surfaces with continuous and substantially uniform force during the winding operation.

26. Peterson 940,188, November 16, 1909.

The process of making insulating material which consists in coating a web of paper with shellac as it passes over a belt moving at the speed of the web, applying overlapping fragments of mica to the shellac, covering the mica midway of the belt with a second web of paper and then drying by heat.

27. Peterson 973,557, October 25, 1910.

The process of making insulating material which consists in



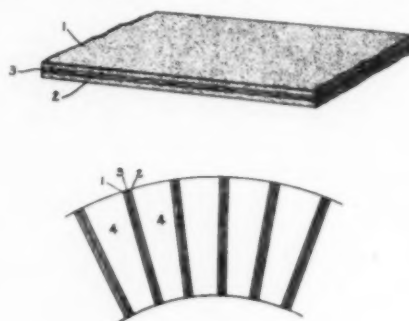
Built up rings of mica held together with a silicate cement. Such products are entirely incombustible. (from U. S. P. 973,557.)

building up fragments of mica into a desired form and heating it to expel the air, plunging the same into an insulating compound of kaolin and silicate of soda to absorb the latter, applying pressure thereto and then firing at a red heat under pressure.

28. Cooper 985,399, February 28, 1911.

A flexible mica tape which

maintains its insulating properties under high temperature, that comprises outer strips of thin paper, mica sheets assembled between said strips, and a binder that consists of a mixture of approximately four parts varnish, three parts wood alcohol from which the acetone has been removed and one part castor oil.



The first figure shows a commutator separator built up of mica and a plastic binder; the lower figure its use between the metallic layers in the commutator. (from U. S. P. 1,049,918.)

29. Rice, Jr. 1,049,918, January 7, 1913.

A commutator having insulating material between the bars built up with thin layers of mica and layers of more friable insulating compound.

30. Peterson 1,098,967, June 2, 1914.

The process of forming mica insulating material which consists in spreading fragments of mica provided with adhesive over an extended area to form a sheet, pressing the sheets between rigid plates with a compressible material adjacent the mica to give the sheet a uniform density and make the face of the sheet adjacent the yielding material uneven and then planing off the uneven surface.

31. Bolling 1,123,985, January 5, 1915.

The process of making an insulating material of the character described, which consists in mixing mica flakes with a fluxing material containing boron, silicon and lead and having a melting point between 500 and 950°C. heating the mass to said temperatures, and subjecting it at the same time to high pressure.

32. Longmore 1,138,676, May 11, 1915.

The process of making insulating sheets which consists in depositing a shower of commingled mica flakes and comminuted dry binding material upon a plane surface, placing a heated plate upon said deposited materials, depositing another shower of said materials upon said heated plate, and applying thereto another heated plate.

33. Skinner 1,161,989, November 30, 1915.

A fire-proof insulating material comprising alternate layers of aluminum foil having oxid insulating coatings on their surfaces and mica flakes, the mica flakes being held in position by the foil.

34. Meirowsky 1,163,434, December 7, 1915.

A process of feeding mica sticking machines with the aid of aspirated air which consists in causing the flake of mica to be driven against screening means by said air, and then deposited upon the adhesive plate, the air being heated while passing to the mica receptacle through a heating zone.

35. Ishler 1,223,881, April 24, 1917.

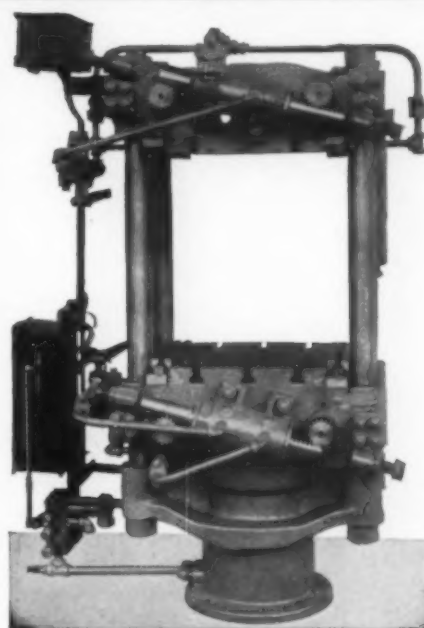
An insulating barrier comprising an oil soaked absorbent sheet, a sheet of mica insulating material at one side thereof and an impervious wrapping of varnished cambric totally inclosing the same.

36. Haefely 1, 228,371, May 29, 1917.

The process which consists in providing upon the surface of a sheet of fabric a wet coating comprising an adhesive material and a solvent thereof, distributing mica flakes upon the wet surface and applying heat and pressure thereto.

This article will continue in December.

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Story by C. W. Rivise
in December



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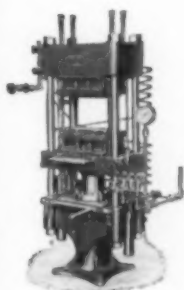
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Fig. 1



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Standard Methods of Testing Insulation

Specification D-48, as promulgated by the
American Society for Testing Materials*

IN October, the 9th section of the standard methods was almost concluded, except for subsection e which reads:—

(e) The speed in inches or millimeters per minute at which the head travels during the test. The time required for testing each specimen should be recorded.

Transverse Strength

In order to determine the transverse strength of a molded insulating material, the following method is prescribed:

Apparatus

10. Any standard testing machine may be used provided it is accurate to within 1 per cent for the lowest load for which it is used. The distance between points of support shall be 4 in. (102 mm.). The supports shall have the contact edges rounded to a radius of $\frac{1}{8}$ in. (3.18 mm.). The load shall be applied midway between the supports by a pressure piece, the bearing edge of which shall be rounded to a radius of $\frac{1}{8}$ in. (3.18 mm.).

Specimen

11. The test specimen shall be molded to the dimensions shown in Fig. 3.

Method

12. (a) Five specimens shall be tested in the condition in which they are received.

Additional tests shall be made at elevated temperatures as outlined in Section 8.

*By courtesy of the Society and with permission.

NOTICE

As a result of three meetings of Committee D-9 and its sub-committees late last year and in February and April 1928 new tentative standards have been formulated which modify those we have printed in the October issue and in the present article. For sake of completeness we will print the methods known as Serial Designation D-48-77 first and then the proposed revisions.

For all details in connection with Committee D-9 our readers are referred to Dr. T. S. Taylor, Secretary of the Committee, care of Bakelite Corp., 230 Grove St., Bloomfield, N. J.

We are indebted to Dr. Taylor for calling our attention to the revised methods.



Fig. 3.—Transverse Test Specimen (Specimen No. 4).

Report

(b) The cross-head speed of the testing machine shall be such that the load can be accurately weighed but shall not exceed 0.050 in. (1.27 mm.) per minute when the machine is running idle. Measurements of the deflection may be taken for very elastic materials.

Report

13. The report shall include the following:

(a) The thickness and width of each specimen as measured by a micrometer in inches or millimeters;

(b) The load on each specimen in pounds or in kilograms at the first sign of failure;

(c) The maximum fiber stress

in pounds per square inch or in kilograms per square millimeter calculated from the formula:

$$S = \frac{3 P l}{2 b d^2}$$

in which S = maximum fiber stress, P = load applied, l = distance between the supports, b = width of specimen, and d = depth of specimen;

(d) The rate at which the load was applied;

(e) The maximum deflection at the center in inches or in millimeters.

Dielectric Strength at Commercial Power Frequencies

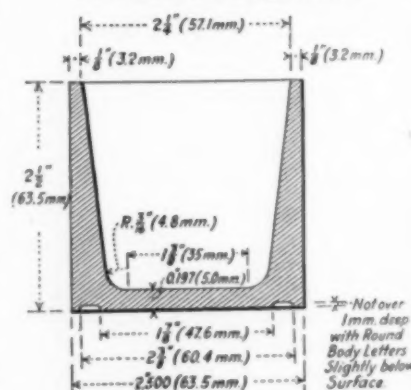


Fig. 4.—Dielectric Test Specimen (Specimen No. 1).

Apparatus

14. (a) Any well-designed high-tension transformer connected to an alternating current

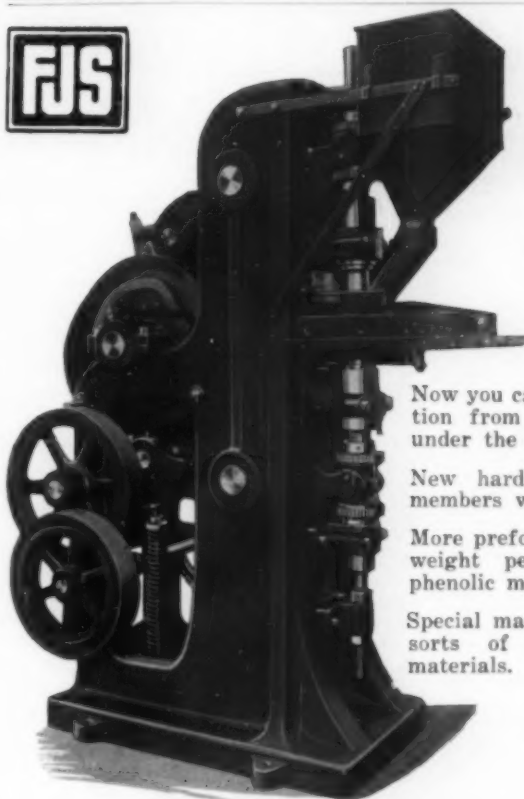
supply having as nearly a true sine wave as possible may be used. The transformer and the source of supply of energy shall be not less than 2 kva. for voltages of 50,000 volts or less, and not less than 5 kva. for voltages above 50,000 volts. The frequency shall not exceed 100 cycles per second.

(b) Regulation shall be so controlled that the high tension testing voltage taken from the secondary of the testing transformer can be raised gradually from any point and in no case more than 500 volts at a step. The control may be made by generator field regulation, with an induction regulator, or with a variable ratio auto transformer. Any method of regulating the voltage is satisfactory which does not distort the wave more than 10 per cent from a sinusoidal shape.

(c) The voltage may be measured by any approved method which gives root-mean-square values, preferably by means of a voltmeter connected to a special voltmeter coil in the high tension winding of the testing transformer or to a separate step-down instrument potential transformer. A voltmeter on the low tension side of the transformer is satisfactory, if the ratio of transformation does not change under any test condition. An electrostatic voltmeter properly calibrated in the high tension circuit is also satisfactory. A spark gap may be used to check the readings at very high potentials.

(d) Some protection is desirable in the high tension circuit of testing transformers where the potential is 25,000 volts or over, to prevent dangerous surges and limit the current when the test specimen is punctured. It is, however, desirable to have as much energy available as possible when puncture occurs. If impedance in the form of choke coils be used in series with the high tension terminals, it should not be greater than that which will

(Continued on page 628)



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TECHNICAL ABSTRACTS

AND PATENT REVIEW

Sound Record and Sulfur-resins for making the same. Oscar A. Cherry, assignor to Cutler-Hammer Mfg. Co., Milwaukee, Wis. U. S. P. 1,671,228; May 29, 1928.

Records for phonographs, etc., are made from a sulfur-naphthalene or sulfur-phenol resin to which there has been added an improving or modifying agent of the nature of the "resin or ozocerite" or carnauba wax. A resin such as that obtained by the action of sulfur monochloride on naphthalene in the presence of iron as a catalyst may be used. An alternative is a sulfur-phenol resin. These resins, when thus mixed with wax, are mixed with the usual fillers and form a molding composition that works well in sound-record molds.

Pyroxylin coated paper phonograph record. Frank E. Sincere, Mount Vernon, N. Y. U. S. P. 1,671,877; May 29, 1928.

A phonograph record said to be equal to any is prepared by thoroughly impregnating card board discs in a three-step process with solutions of pyroxylin plastics, specifically with a methyl alcohol solution of cellulose nitrate, with the addition of acetone, benzene and amyl acetate, zinc oxide and carbon black; the latter as a coloring agent. The impregnation and coating of the cardboard discs takes place by dipping, whirling to remove excess, and drying, at least three applications being required. Molding takes place as usual from sound-record matrices.

Lowering the Viscosity of Cellulose Nitrate. Chauncey U. Prachel, assignor to Eastman Kodak Co. U. S. P. 1,661,736; March 6, 1928.

Cellulose nitrate waste such as the scraps from comb manufacture, photographic film and the like is treated with a mixture of nitric and sulfuric acid containing insufficient nitric acid to increase the nitration of the product. The preferred bath comprises from 5 to 20% of nitric acid, 10 to 30% of sulfuric acid and from 1/2 to 10% of nitrogen oxides. The treatment requires several days at room temperature.

Modifying Cellulose to Obtain a More Plastic Cellulose Acetate. Maurice Cusin and Pierre A. A. Chevalet, the first-mentioned being assignor to Societe Lyonnaise de Soie Artificielle, of Lyon, France. U. S. P. 1,671,513; May 29, 1928.

To render cellulose better capable of acetylation so that a more plastic cellulose acetate may be obtained, the cellulose is subjected to a preliminary treatment with a solution of 80% formic acid 100 parts, and 66°Be. sulfuric acid 15 parts. The treatment lasts two hours, following which the

cellulose is washed and dried. It acetylates with the utmost facility.

Reducing Viscosity of and Increasing Solubility of Cellulose Nitrate. Stanley D. Shipley, assignor to Atlas Powder Co., Wilmington, Del. U. S. P. 1,652,587; Dec. 13, 1927.

The inventor states that when boiling cellulose nitrate under pressure with water to decrease the viscosity and to increase its solubility in organic solvents, that the effect is greatly increased by the use of metallic catalysts. These may be in the form of the vessel itself, such as using an aluminum vessel, or the metals or other catalytic agent may be added as desired in powder or bulk form. The catalysts used include such materials as silver, glass, wood, nickel, iron, gold, copper, lead, tin and zinc. The presence of salts, such as soda ash also help the process. The process can even be carried out without pressure. Other non-solvent liquids may replace the water.

The process is particularly suitable for reclaiming old smokeless powder, as pressure is not essential. For example when cellulose nitrate was boiled in a closed autoclave at 15 lbs. pressure for 24 hours, and subsequently dissolved in a solvent, the following lowering of the viscosity was noted:

Container made of	Acetone solution	Viscosity after		
		8 hrs.	16 hrs.	24 hrs.
Aluminum	6 oz.	33	9.2	4.0
Silver	6 oz.	35	10.4	4.8
Glass	6 oz.	37	10.0	5.2
Wood	6 oz.	38	11.6	5.2
Nickel	6 oz.	40	11.6	5.0
Iron	6 oz.	41	10.4	5.4
Gold	6 oz.	45	11.6	5.2
Copper	6 oz.	45	12.4	6.4
Lead	6 oz.	45	12.4	6.4

The claims cover both the use of aluminum as a catalyst and the mere heating of cellulose nitrate with a water solution of soda-ash, or even just an alkaline salt.

Floor filler with pyroxylin base. Arnold M. Taylor and Frank A. Buote, assignors to Atlas Powder Co., Wilmington, Del. U. S. P. 1,665,383; Apr. 10, 1928.

Comprises a solution of ethyl acetate 10, denatured alcohol 30, gasoline 30 and toluene 30, in which there has been dissolved 2.2 ozs. of nitrocellulose, 2.5 ozs. of resin and 10 lbs. of starch. Strange to say the amount of liquid to the solids is not stated, neither in claim or specification. The main object is to produce a solution which on drying will precipitate out the lacquer ingredients so as to fill the pores of the wood. It is intended as an undercoat for pyroxylin floor paints and the like.

Camphor recovery from pyroxylin

plastics. Alexander Frieden, assignor of 1/3 to Raymond F. Bacon and 1/3 to Alcan Hirsch, New York, N. Y. U. S. P. 1,666,645; Apr. 17, 1928.

Pyroxylin scrap is heated with solutions of alkalis of such strength that no substantial decomposition of the pyroxylin takes place. Scrap celluloid, for example, cut to pieces 1/32" thick or less are covered with a caustic soda solution (NaOH from 3-12% of the weight of the celluloid) and the mixture is subjected to steam distillation, whereby the camphor distills pyroxylin is suitable for making lacquer with the water. The residue of quers, etc. The camphor recovery is said to be quite high.

Flexible Phonograph Record with Pyroxylin Sheet center. Frederick G. Mitchell, Birghton, Victoria, Australia. U. S. P. 1,671,437; May 29, 1928.

A flexible strong but thin sound record of the disc type is made by softening a thin sheet of pyroxylin plastic in a solvent comprising amyl acetate, acetone and ether, with or without camphor; or in alcohol-camphor; or amyl acetate alone or the like, following which a thermoplastic shellac molding mass is applied to the softened pyroxylin sheet which is then hung up to dry and season for a few days. The sheets are then placed between the usual record matrices and molded in the regular manner. The records are flexible but virtually unbreakable due to the flexible pyroxylin center.

Molded Article; loud-speaker horn. Fred W. Temple; U. S. P. 1,650,307; Nov. 22, 1927.

A method of producing an amplifying horn, which method comprises arranging a spacing member around a flexible core, arranging the core in the cavity of a mold in such manner that said spacing member contacts and spaces different surfaces of the core from each other, pouring casting material into said cavity to form a molded body and removing said flexible core from said molded body to provide a tortuous sound passage therethrough.

Manufacture of Cellulose Esters such as acetate. Henri L. Barthelemy, assignor to Ruth Aldo Co.; New York, N. Y. U. S. P. 1,668,482; 1,668,483; 1,668,484; 1,668,485; all of May 1, 1928.

This group of related patents covers improved methods for preparing cellulose esters. In their numerical order the patents cover (1) A process of manufacturing acetyl cellulose for subsequent industrial utilization, consisting in first obtaining a primary

solution of cellulose acetate from bleached cotton, glacial acetic acid, acetic anhydride and sulphuric acid; then heating this solution, then introducing acetic acid gradually into the solution; then reducing the temperature; then adding acetic acid containing in solution hydrochloric acid and hydrofluoric acid, the temperature being maintained long enough to furnish at the end of the operation a cellulose acetate soluble in acetone; then flocculating the product, and thereafter by washing and driving the product. (2) A process for softening cellulose fibers in order to facilitate their esterification, consisting in subjecting the mass of fibers to the combined action of the vapors of glacial acetic acid and chlorine to soften both the cuticle and the internal tissue jointly and to lessen the amount of the sulphuric acid required for the esterification of the mass. (3) 1. A process for the esterification of cellulose or its transformation products, consisting in subjecting the cellulose mass to a series of at least four successive partial acetylations each of which is deferred until the preceding one has terminated. 2. A process for the esterification of cellulose or its transformation products, consisting in subjecting the cellulose mass to the action of a halogen, and then to a series of successive partial acetylations. (4) A process of preparing cellulose acetates, consisting in first subjecting cellulose to the action of an alkaline solution containing peroxides and a soap which will diminish the superficial contact tension and facilitate the diffusion of nascent oxygen then treating the mass to soften the fibres by subjecting the mass to the action of a halogen and vapor of acetic acid, then effecting acetylation in a series of steps in such manner that each successive step is performed after the chemical reaction of the preceding step has attained substantial equilibrium, the amount of acetic acid and catalyst containing sulphuric acid used in the bath being determined by the number of acetyl groups which must be present in the cellulose mass at the end of each addition; then effecting saponification in the presence of hydrochloric acid to ensure elimination of sulphates and afterwards precipitating the acetic sol.

Fatty Acid Esters of Cellulose. Hans T. Clarke and Carl J. Malm; assignors to Eastman Kodak Co. U. S. P. 1,668,944; May 8, 1928.

The product covers a fatty acid ester of cellulose having substantially one molecular proportion of fatty acid combined with an amount of substantially unhydrolyzed cellulose corresponding to twenty-four carbon atoms, said fatty acid having more than one and less than eight carbon atoms. The process is exemplified by one of the claims which covers: In the process of making a cellulose ester of a fatty acid, heating together substantially unhydrolyzed cellulose and a fatty acid having more than one and less than eight carbon atoms, said acid being the sole acylating agent, the temperature during the reaction being kept below the decomposition

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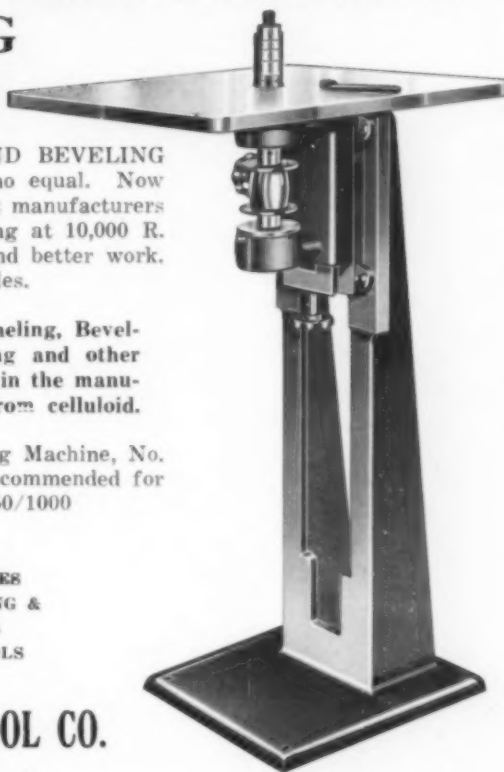
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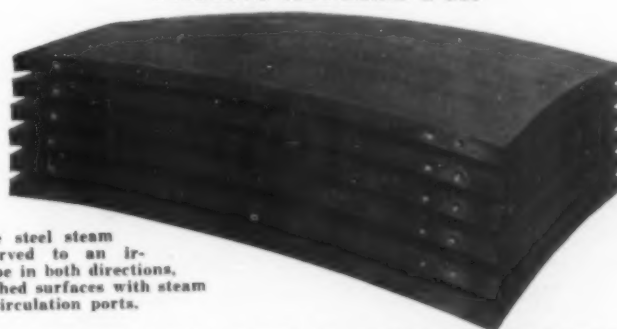


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Standard Testing Methods

(Continued from page 625)

limit the high tension current to double the normal rated current of the testing transformer.

When a spark gap is used, a non-inductive resistance of about one ohm per volt may be inserted in series with one terminal of the spark gap, to damp high frequency oscillations at the time of breakdown and limit the current flow. This resistance shall be as near the gap as possible. If the test is made with one side grounded, this resistance shall be on the ungrounded side of the circuit, and if neither side is grounded the resistance shall be inserted one-half on each side of the spark gap. Water tube resistors are preferable to carbon for this purpose, as carbon resistance may be materially decreased by the passage of current.

(e) The apparatus used and the method of measuring the voltage shall meet the requirements of the standardization rules of the American Institute of Electrical Engineers.

Specimen

15. The test specimen shall be molded to the dimensions shown in Fig 4. If the material cannot be molded to the full height shown, the height may be reduced to 1¼ in. (31.8 mm.).

For materials having a puncture value higher than 300 volts per mil, the thickness of the bottom of the specimen may be reduced to 0.098 in. (2.5 mm.). It should be noted, however, that the apparent dielectric strength in volts per mil may be increased as much as 50 per cent when the thickness of the bottom of the specimen is so reduced.

Method

16. (a) Voltage shall be applied to the test specimen by floating the specimen on mercury and placing a pool of mercury about ⅛ in. (3 mm.) deep inside the specimen.

It is recommended that all tests be made in air, but whenever it is impossible to puncture

the specimen in air without arcing over the edge, it shall be immersed in high grade transformer oil. On specimens which require a very high voltage to puncture, it may be necessary to put a glass tube or shield over the wire leading to the mercury on the inside of the specimen in order to prevent breakdown over the surface of the oil between terminals. The testing voltage shall be raised at a constant rate of approximately one thousand volts per second until puncture occurs.

(b) Five specimens shall be punctured in the condition received at normal room temperature of about 20° C. (68° F.) in order to determine the uniformity of the molded material.

Additional tests shall be made at elevated temperatures, the actual temperatures selected depending upon the use that is to be made of the material. Five specimens shall be tested at each temperature while in an oven maintained at the proper temperature, either by hand adjustment or by automatic thermostat. Specimens shall be placed in the oven at least 30 minutes previous to testing and the temperature shall then be maintained approximately constant at the testing temperature until the completion of that test. Temperature shall be determined by means of a thermocouple

or a mercury thermometer placed in the oven close to the specimens and care shall be taken to avoid placing the specimens too close to the heater.

Specimens with which arcing over the edge is encountered shall be tested under oil as described in Paragraph (a), and in such cases the oil bath containing the specimens shall be installed in the oven and the temperature determined by immersing the thermometer in the oil.

Three specimens shall be punctured after they have had the rim immersed in melted paraffin for a depth of 1 in. (25.4 mm) and have been entirely immersed in water for 48 hours at normal room temperature of about 20° C. (68° F.). The surface of the specimen shall be wiped off with a dry cloth to remove all trace of excessive surface moisture and the puncture test made immediately.

(c) The results from specimens where puncture takes place up on the side of the specimen instead of through the bottom shall be discarded. Experience shows that very plastic materials which flow easily in the mold always puncture through the bottom, while materials which do not mold readily will often puncture through the side walls of the specimen at some distance up from the bottom.

Report

17. The report on the dielectric strength test shall include the following:

(Please see page 629)

Technical Abstracts and Patent Review

(Continued from page 627)

points of the ingredients and product, and the proportion of water in the reaction mass permitting the acyl group in the ester to reach at least 4%.

Resin-impregnated fabric and articles molded from the same. Sanford Brown, assignor to Bakelite Corporation. U. S. P. 1,673,797; June 19, 1928.

The individual fibers or threads of a fabric are impregnated with a resin while the latter is in colloidal suspension in water. The fibers or threads are then dried and woven into a fabric. The fabric is molded under heat and pressure. Claim 3 reads:

Process of making molded articles comprising a fabric and a phenol resin binder, consisting in impregnating a fibrous thread by means of a phenol resin in colloidal suspension, drying and weaving, and molding the resulting fabric.

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(a) The thickness of the bottom of each specimen measured with a micrometer in the direction perpendicular to the bottom surface, and also the thickness at the point of puncture, regardless of the path taken by the discharge. The thickness of each specimen shall be given in mils or in millimeters;

(b) The puncture voltage of each test specimen expressed in terms of the effective (root-mean-square) value;

(c) The volts per mil or per millimeter as calculated from the measured thickness of the bottom of the specimen;

(d) The general character of the material tested with regard to leakage, if any is observed.

(e) The temperature at which each test was made.

Methods for testing the distortion under heat follows next month.

Plastic Rubber

(Continued from page 614)

Further Examples

Rubber	100
P-toluene sulfonic acid	8
Sulfuric acid (sp. gr. 1.84)	2
Water (parts by weight)	2

are mixed by masticating the rubber and gradually adding the ingredients previously stirred together. After these ingredients have been added, the rubber is repeatedly forced through tight rolls to insure homogeneity. The mixing time required for a 10 pound batch is about 30 minutes. The mix is then heated for 7½ hours at an oven temperature of 190° F., followed by 10 hours at 266° F. An exothermic reaction takes place. Water and sulphur dioxide as well as other vapors are given off. The weight loss approximates 7%.

The presence of more or less moisture is of little effect except to vary the time of heating of the mix or to aid in mixing the two acids into the rubber. I find, irrespective of the moisture, a desirable ratio of rubber, p-toluene sulfonic acid and

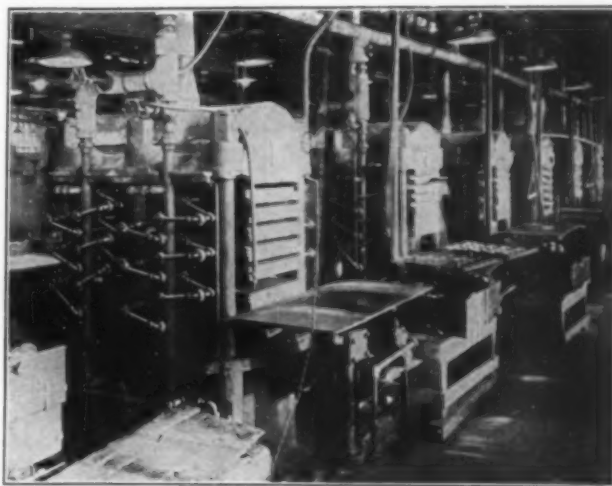
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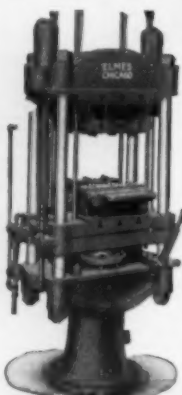
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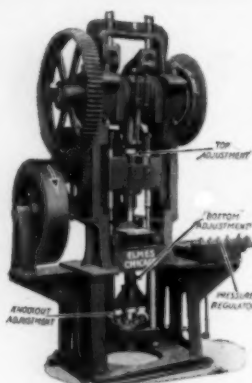


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sulfuric acid to be 100:8:2. These ratios, however, may be varied according to the properties desired in the final product. Increase of sulfuric acid content tends to raise the softening temperature of the final plastic and renders the product more brittle.

The time and temperature of heating are also variable depending not only on composition of the mix but even to a greater degree on the size of batch which is placed in the heater. A one pound batch in the heater may reach an internal temperature of 300° F. due to exothermic reaction, a 10 pound batch in the same oven may reach 400° F., and a 25 pound batch may rise as high as 500° F., the oven temperature being as given in the above example.

The temperature reached during the reaction is also dependent on the shape of the batch. A 10 pound batch sheeted 1/2 inch thick, for example, will not reach as high a temperature as when heated in lump form. The physical properties of the final product, however, are dependent to a far greater degree on the composition of the mix than on the temperature of the mass during the heating.

Phonograph Records

In the manufacture of phonograph records or other molded articles, it is desirable to use compositions which will flow rapidly and easily, when hot molded, so as to reduce the time necessary for molding. For shellac record tablets or similar molded articles, it has been customary to use certain lubricants, softening agents or fluxes such as paraffin, ceresin, stearic acid or the like. I find these materials, in general, to be equally desirable in molding compositions containing shellac-like derivatives of rubber.

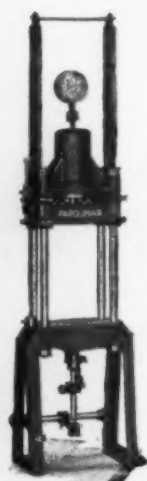
In the following example, the reaction product of rubber with a mixture of sulfuric and sulfonic acids will be referred to by the term "plastic A."

Example II.—A non-tacky molding composition suitable for such purposes as preparing

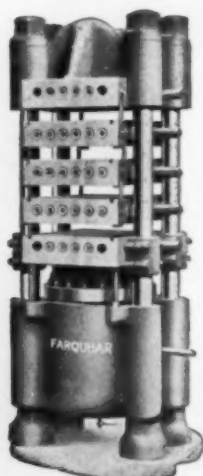
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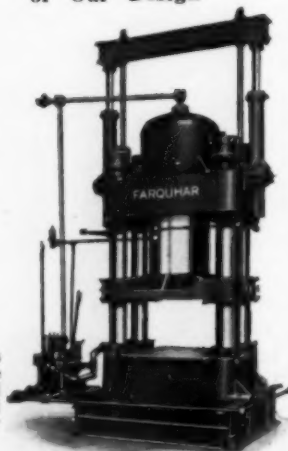
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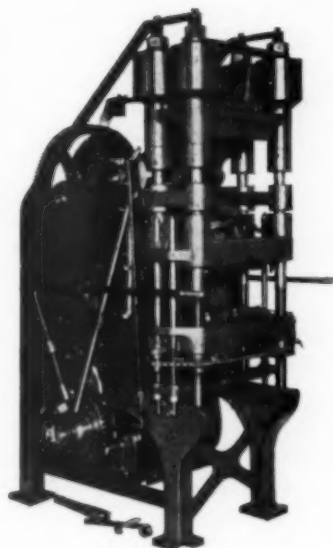


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phonograph records, having desirable physical properties, such as easy molding, desirable tone qualities and resistance to needle abrasion is prepared by grinding together plastic A—350, iron oxide—410, gas black—150, cotton flock—50, benzidine—20 (parts by weight). The powdered mixture is then placed on a hot rubber mill and fluxed into a continuous sheet. There is then added stearic acid—20 (parts by weight). After proper mixing and refining on a tight mill the hot batch is sheeted to the proper thickness and blanks for record molding are cut therefrom, cooled and stored for later use in the record presses. For molding records, the blanks are warmed on a hot table heat-

ed by steam at 110-120 pounds pressure, transferred to a record molding press heated to approximately the same temperature and the press closed with hydraulic pressure. Immediately after closure of the press, the steam is turned off and the matrices cooled with running water. The press is then opened, the record tablet removed and steam turned on preparatory to the next molding operation.

The last patent to be taken up at present has for its object the utilization of paper-mill sludge composition as a filler in conjunction with rubber.

In the manufacture of paper, and particularly in processes involving the reclamation of old paper, there is produced a con-

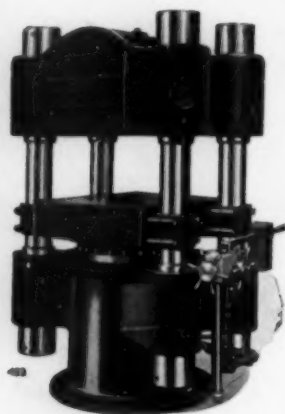
siderable bulk of material usually called sludge, which mixed with large quantities of water, is allowed to run off from any or all of the mechanical equipment and tanks of paper mills.

Binders Used

In the utilization of this paper mill sludge, it may be employed of itself, or may be mixed with any of a number of binders or fillers. In such use, the settled material as it has accumulated in the lagoons may be used without further treatment, although if desired it may be purified as by washing or in any other desirable way. The material, either purified or not as desired, may then be compressed into a sheet or block, and used as such,

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or it may be used in powdered or shredded form.

Among the binders which have been found to be desirable additions when binders are used are the following: animal and vegetable glues; waxes; gums; resins, either natural or artificial; rubber; hydrocarbons and bitumens, and their derivatives and compounds; silicates; and colloids. Shellac and similar materials may be used also. As fillers, there may be any of the usual mineral, vegetable, or animal fillers, and more particularly there are mentioned, cements, plaster of Paris, starch, etc., calcareous materials, silicates, etc. In giving these materials it is obvious that in some instances the binders may also act as fillers and vice versa.

Usual Mixing Methods

In compounding the paper mill sludge with the selected fillers or binders or both, any ordinary method of combining them may be employed. For example in mixing the rubber containing compositions it is desirable to use the usual milling machine wherein the rubber is placed upon one of a pair of heated rolls, and the sludge, either in powdered, shredded, or compressed form added thereto. In this way homogeneous products are easily obtained. The resulting rubber sludge compositions have many properties different from those of ordinary rubber, and are therefore particularly adapted to a number of uses. For example the stretch of the composition is less than that of ordinary rubber, and the flexibility is also lower. These compositions are therefore peculiarly adapted to the manufacture of fabricated products such as boot heels and soles, steam hose, flooring, belting, and mechanical rubber goods of all descriptions.

It is quite certain that much development along these lines may be expected. The day of cheaper plastic materials is not far away.

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Patents on Resinoids (Continued from page 618)

of urea is added, carefully avoiding local cooling and introducing the urea solution gradually instead of all at one time. The process also covers adding heated urea to a formaldehyde solution.

The second patent covers an improvement in making urea formaldehyde condensation products. In the past it was found that cracks would develop in urea-formaldehyde hardened masses. It is now said that these were caused by the formation of formic acid in the material by ageing, and this caused internal strains leading to cracks and crumbling. This is now overcome by adding to the materials a stabilizer in the form of para-toluene-sulfonamide. For example 706 grams of an alcoholic

Julian F. Smith, Ph.D.
Irene F. Smith, M.S.

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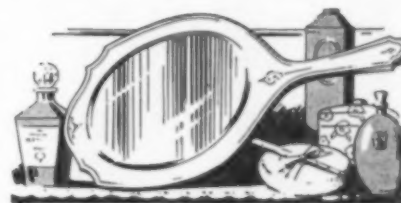
Large manufacturer of plastics in the vicinity of New York City has openings for two engineers with about ten years' experience in the pyroxylin plastics or rubber industries.

1—A technical graduate who has been in responsible charge of factory maintenance and construction for a sufficient period to be qualified to supervise repairs and to assist in directing the installation and erection of equipment.

2—A mechanical or chemical engineer who has specialized in plant development work. He must be a competent designer and able to analyze manufacturing processes with a view to cutting costs by the introduction of mechanical improvements.

In replying state qualifications and salary expected. Address, Plastics, Box 502.

solution of formaldehyde are mixed with 171 grams of para-toluene-sulfonamide and brought to a boil, in a container fitted with a reflux condenser. Then 180 grams of solid urea (or an alcoholic solution thereof) are added and the boiling continued until condensation takes place. The liquid condensation product can then be mixed with fillers



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such as wood flour, mica, asbestos etc., dried and molded under heat and pressure. A molding temperature of 300°F leads to products that may still be softened by further heating, but this will then lead to desirable infusible products. The intermediate reaction products are soluble in cellulose ester solvents and may be combined with the latter to form excellent lacquers or varnishes.

To make a product capable of use for laminations, 4500 grams of an alcoholic solution of formaldehyde (50% by weight, and practically free from water) and 513 grams of para-toluene-sulfonamide are treated as above described with 1800 grams of urea. After about fifteen urea. After 15 minutes heating, 90 grams of oxalic acid are added, and the condensation completed by boiling.

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Conclusion

About every three months we will continue to offer our readers this service of reviewing for them the American patents in the field of resinoid production. Similar articles on the cellulose ester plastics are also in preparation, as it must not be assumed that because the resin art is active that the pyroxylin and other cellulose ester workers are standing idly by. The producers of the casein solids are also en-

gaged in active competition with the resinoid materials, although the work is not as yet penetrating to the public in the form of patent applications at nearly so rapid a rate as is the case with the resins. The latter, due to the expiration of some of the early basic Bakelite patents, are naturally in the lead at present, by reason of the greatly increased attention given to them when once the field was more or less free for competing products.

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Technical Abstracts

Casein plastic made with furfural and insoluble soaps. Harry S. Snell, assignor to Western Electric Co. U. S. P. 1,678,713; July 31, 1928.

An alkaline casein solution is mixed with a soap such as sodium oleate and the mixture is precipitated with a metallic salt solution such as aluminum acetate, thus forming aluminum caseinate and oleate as insoluble products. These are whirled or fettered off, dried and treated with furfural to produce insoluble and non-hygroscopic products. 15. A method of producing a plastic composition, which consists in forming a solution of a soluble caseinate, adding aluminum acetate to the solution to form a precipitate of aluminum caseinate, and treating the precipitate with furfural.

Recovery of insoluble urea formaldehyde resin scrap and waste. Alphonse Gams and Gustav Widmer; assignors to Society of Chemical Industry, Basel, Switzerland. U. S. P. 1,679,246; July 31, 1928.

200 parts of the waste (splinters, shavings), obtained in working solid hardened condensation products from urea and formaldehyde, are heated at 120° C. for 2-3 hours with 250 parts of formaldehyde of 36.5 per cent strength. There is obtained a thick solution which is diluted with 100 parts of water and then heated with 30 parts of urea for 16 hours. The mass obtained is evaporated to a syrup and may be worked up in the usual manner.

Japanese Plastics

(Continued from page 612)

If desired the treatment with the glutinizing and condensing agents may be simultaneous or consecutive. It is even possible to omit one or the other of the treatments or both.

Viscous plastic materials such as viscose, hydrated or gelatinized cellulose derivatives as well as organic or inorganic fillers such as cotton or other fibrous material may be incorporated into the mass to give it desired properties.

Sato's inventions are, however, not confined to the vegetable proteins and proteids. In Japanese Patent 37,025 (1920) he heats a mixture of an animal protein such as casein with an anhydrous formaldehyde generating compound such as formamidine or paraformaldehyde under pressure. The product is suitable for insulation.

MOLDED PRODUCTS

Devoted to the purchase, further use and merchandising of all manner of molded parts

Vol. 2

NOVEMBER, 1928

No. 11

Cellulose Acetate Molding Powders

Some examples of brilliantly colored, pure white and transparent molded products.

MUCH white paper has been covered with print on the subject of cellulose acetate molding powders. The patent literature of most countries of the world, the United States included, contains significant numbers of patents granted in this field as compared with the sphere of synthetic, moldable resins. Cellulose acetate products and articles of all types seem to fascinate and charm all who are newly initiated to its properties. Yet a careful survey proves that practically no commercial molding of cellulose acetate powders is being carried on.

The ancient cry in explanation of this is that the cellulose acetate ester, as compared with nitro cellulose, is too expensive due to the high cost of acetic anhydride required in its manufacture. This condition has been partly alleviated by the considerable reduction in prices during the past year due to the activity of the cellulose acetate silk industry. With completion

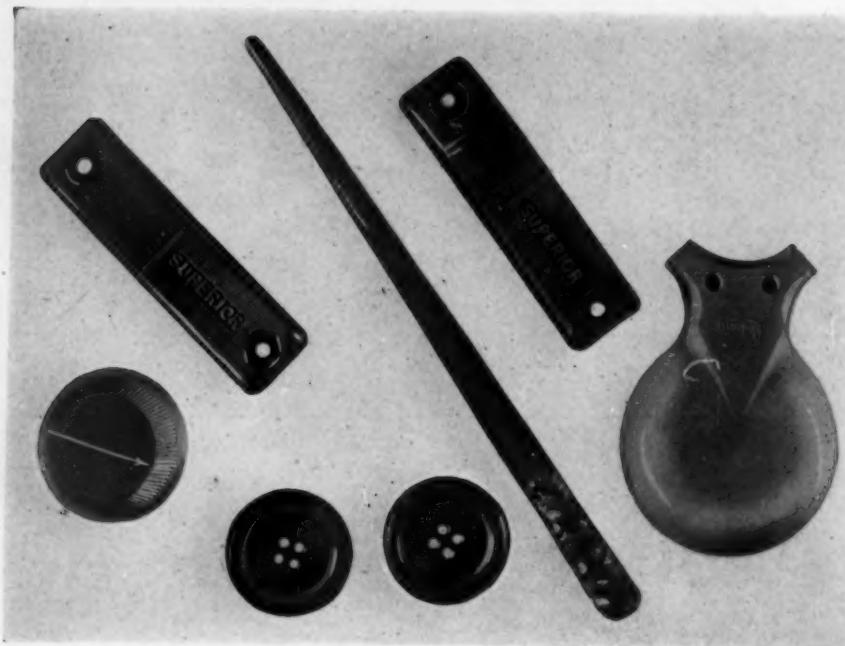
of the acetate silk projects now under way, it is not inconceivable that additional price reductions of cellulose acetate due to greater production are approaching. But price alone has not been the only hindrance in the way of widespread acetate molding. Education of molders and the buying public in its unique properties has been a tedious process and the production of uniformly satisfactory molding powders has been very slowly realized.



White Flush Plate in Leather Finish.

The articles reproduced in this paper represent commercially practical applications of a cellulose acetate molding powder newly introduced in the plastic industry. These powders have passed the experimental state of development and are being used to replace both natural and synthetic materials, depending on the use to which the finished article is to be put. The weekly capacity of the present equipment is three tons of powder of various grades, which in time will be increased to meet the demands of the industry.

The outstanding advantage of molded cellulose acetate over synthetic resinoids is its color. Pure white, delicately tinted pastel shades, pale creams, light greens, and the like, have not yet been obtained with any of the resinoids, but which may be repeated with uniform results in a molding powder in which cellulose acetate provides the plastic substance.



Buttons, Penholders, Castanet and Radio Knob molded in white, light pastel and mottled cellulose acetate powders.

All of the colored articles shown herewith are either white or faintly tinted whites. The castanet is a beautifully polished white which requires no additional handling on removal from the mold. The radio knob is also a pure white, which may open up a possibility of using brilliant black and white modernistic designs in radio cabinets, using cellulose acetate plastic. Another variant of the color possibilities is mottling on a white base. In the penholder handle, a pale blue and metallic gold bronze are mottled on a white base, giving a very pretty effect, as the illustration shows.

Where transparency is required, cellulose acetate may be molded clear and water-white. The most carefully controlled synthetic resinoid yields a transparent product which at best is straw-colored. This is an inherent characteristic of the compound and not due to careless manipulation. These cellulose acetate powders, on the other hand, yield a product which approaches window glass in color and transparency.

The powders described here are already finding some application in the electrical field as the illustrated flush plates and insulators indicate. It is a re-

cognized fact that cellulose acetate has high dielectric strength and is noninflammable. These properties are especially advantageous in raising the arc-over breakdown voltage. In the case of resinoids this breakdown occurs at relatively low potentials and becomes evident by the formation of a black line of carbon on the surface between the two live contacts. This weakness is eliminated by the use of molded cellulose acetate articles which withstand high voltages in the "arc-over" test. Where large articles are required and solid cellulose acetate would be too costly, acetate sheet material has been successfully

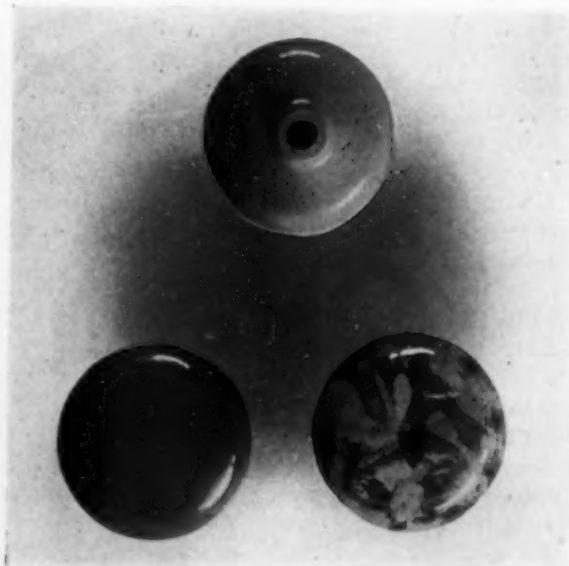
anchored to flat phenolic resinoid surfaces merely by the action of heat and pressure, resulting in an article which had high "arc-over" strength.

Electrical appliances which are designed to hold insulating oils are eminently satisfactory when molded out of these powders. The molded articles are completely insoluble in alcohol, benzol, gasoline, water, and mineral and vegetable oils. Sludging does not occur as in resinoid or hard rubber containers, thereby lengthening the life of such installations.

A range of fourteen grades of hardness and flexibility is available in these powders. This property makes them adaptable in a wide variety of articles in which the other synthetic plastics have a limited or only partially satisfactory application because of their uniform rigidity and brittleness. The buttons shown, two of a lot molded by the Scranton Button Co., withstand severe mechanical shock far better than vegetable ivory or casein yet do not soften under temperatures below 500° F. A thin-walled article such as a fountain pen barrel molded with these powders may be dropped from considerable heights without any danger of splitting.

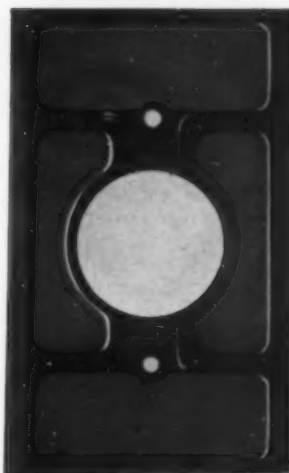
In using the cellulose acetate powders, the molder encounters few departures from the usual phenol-formaldehyde practices. Temperature and pressure and

Light colored Cellulose Acetate Gear Lever Knobs with metal parts inserted in molding operation.



time cycles are about the same. Metallic inserts may be imbedded in the mold, as in the example of the threaded piece in the knobs pictured. There is no waste, however, since all excess material squeezed out is reworkable, the cured stock being fusible.

The question now arises as to what the limit of possibilities is with this new material. It has been used in making, in addition to those already mentioned, binocular shells, lamp shades, bathroom tiles, toothpaste caps in colors, radio panels, lipstick tubes, cigarette holders and mechanical pencils. It can be pressed, extruded in a die of any shape to produce any article in which the mechanical, electrical



Flush Plate Molded in Transparent Acetate Powder.

and chemical-resistant properties, peculiar to it and enumerated here, are desired.

New Acid-Resisting Pump Made From Synthetic Resin

IN chemical works it is frequently necessary to transfer acid liquors from one vessel to another, and for this purpose centrifugal pumps are required of material that will resist the corrosive action of such liquids. The European manufacturers of synthetic resins have now turned their attention to this important problem. The general properties possessed by synthetic resins place them in a very suitable class for such an application, and it has been mainly a matter of mechanical adaptation which has retarded development in this direction.

A short time ago the manufacturers of Haveg, a well-known synthetic resin product, placed on the European market a pump made of this material. Haveg is very light and very strong. The specific gravity is 1.6 and the compression strength 5.2 tons per square inch. It resists sudden knocks, jars and blows remarkably well. It remains unaffected by sudden temperature changes and can be suddenly cooled from 130 degrees C. to freezing point or below without fracture. More-

over, its heat conductivity is very low. These physical properties, combined with its resistance to most corrosive liquors, make Haveg a valuable material for the purpose.

The new Haveg centrifugal pump consists of three units, viz., the pump itself, the bearing, and the motor, all mounted on a bed plate. The pump itself contains no bearing, the rotating part within the pump being overhung. An independent pedestal mounted on the bed plate between the pump and the motor contains two ring lubricated journals and an axial pump shaft which passes into the pump is fully protected by a sleeve of Haveg composition, and the end of the shaft is reduced and screwed to take the impeller, which is molded of Haveg on an internally screwed and externally ribbed cast-iron cap. When the impeller is screwed into position on the end of the shaft a face on the rear of the impeller makes a tight butt joint on the end face of the Haveg shaft sleeve, the metal shaft of the impeller nut being

thus completely enclosed in Haveg.

The pump body of Haveg composition is supported in a cast-iron flange having a base to secure it to the bedplate. The pump body is closed by a cover of Haveg. An important feature is the gland and stuffing box. The Haveg-covered shaft enters the pump through a Haveg gland fitted with a Haveg gland ring and cast-iron collar. The fitting of the gland is very advantageous, as there is no leakage when the pump is stopped or running slowly, as is the case with glandless pumps. The employment of Haveg for the gland parts has produced a corrosion-proof stuffing-box which is of great advantage. Leakage acid escaping through the clearance between the rear of the impeller and the pump body is thrown off by the wheels fixed to pump shaft into a chamber between the impeller and the stuffing-box, whence it returns to the pump inlet through a channel drilled in the body of the pump.

Production of Casein in Argentina

ARGINTEA is the world's leading exporter of casein, supplying two-thirds of the international trade in 1926. However, owing to a drought which affected the entire dairy industry adversely, production of casein in Argentina was smaller in 1927 than in 1926, which was a record year. Exports, which are approximately equal to production since consumption is negligible, amounted to 14,161 tons, as compared with 19,460 tons in 1926. During the first five months of 1928, casein was again exported at the 1926 rate, the five months' total amounting to 8,036 tons. The United States, always the best customer for Argentine casein, took two-thirds of this amount, or 5,176 tons.

The price and production of Argentina casein, which is of the borax soluble type, depend largely upon the price of butter, (Please turn to page 650)

From Drums To Carloads

An Interview With
W. S. Gordon, Jr.

Vice President, General Plastics, Inc.

This is the first of a series of intimate stories of the development of the molding industry to be published in **Molded Products**.

THE story or history of our business? Well, it is hard to know just where to begin because it involves the history of Phenolic Compounds, or, to use the more general trade reference—hot press molding compounds, and to make it complete, I presume, must involve by introduction the early work of Smith, Luft, Manassee, Delaire, etc. For fundamentally we might safely say they started it all, though, of course, their work has no more connection with what is happening today than does the perfectly blended tobacco on sale today have to do with the discovery of the raw product by Sir Walter Raleigh. I am referring particularly to the commercial phases, the advertising and the certainly very much better product than the Aboriginies enjoyed around their council fires."

"It was early discovered in the commercial marketing of a phenolic molding compound that quality was the first requirement of the molder, particularly as to facility and rapidity of molding, for even though the price of a molding material is higher, increased production, fewer rejections and a better product electrically, mechanically or otherwise would actually make the finished article lower in cost. For that reason our first aim was to produce the highest quality products possible within the limits of commercial production. This is still our continual aim at all times. We could not help but recognize that a reduction in cost of this class of molding compound, as well as improved molding methods, would enormously increase the field of application by open-

ing up outlets which had always previously been given no consideration whatever on account of prohibitive cost. Continual improvements in the molding compound, allowing much quicker molding and better methods of molding introduced by the molders themselves opened up many new fields, which, of course, increased the production of the manufacturers of molding compound."

The Manufacturing Plant

"With still greater possibilities of increased production in view, Mr. Dent, President of General Plastics, Inc., and founder of this business, particularly recognized the great advantages in both cost of production and uniformity of product in large scale production units. Accordingly, after very careful study, the largest manufacturing units ever built for the manufacture of resin and molding compound were ordered for the General Plastics plant. One of the units particularly is, as far as we know, very much the largest in operation in this class of production in the world. This large unit production and final blending in carload lots in large

tumbling barrels insures a uniformity which in the earlier days was regarded as almost an impossibility."

"The policy of expansion was later extended to include the sales, advertising and general personnel, both in plant and office."

"With the increase in applications of molding compound due to the greater selling and advertising effort there was a growing demand for new and more vivid colors and for materials to meet certain special requirements. This necessitated an increase in our laboratory facilities far beyond the ordinary requirements of carefully controlling the quality of the production material and continual study for improvement. Odd, but expansion in one part of a business must, it seems, pass on to another and eventually include everything from the number of postage stamps used to the amount of dividends to be paid, and physically from the number of brooms used to clear up the quarters to the number of Vice-Presidents that you have."

"Colors and special applications involve considerable re-



View of the stock room of the General Plastics Plant.

search, a knowledge of colors and color blending involving not only our own staff but the calling in of outside color experts. The old laboratory was completely inadequate to keep up with the many new demands, and we recently, therefore, installed a new laboratory occupying six times the old space completely equipped with small scale production equipment, and a materially increased personnel is devoting definite study to colored compounds. In this way a line of fifteen primary or standard colors has been developed and many special shades of these colors are continually being added."

Mr. Gordon was asked here how he accounted for the success that his company had achieved in breaking into a pretty well established field.

Early Difficulties

"Aggressiveness, being absolutely frank in getting the confidence of those whom we try to sell, and by constantly striving to improve our material," he said with considerable emphasis and added, "by confidence in us I mean particularly, not overstating what Durez will do. In the early days, we Durez men, broke into many molding plants by making good with our samples and we had little reputation at that time, but by overcoming the difficulties we found, we established our product and the best evidence that we have improved the product is the steady growth of our business."

Mr. Gordon was asked if it was not tough—first to get in and then to correct a molder's troubles.

"You bet it was," he said, "sometimes we neither got in nor could we overcome the trouble when we did. But we tried, and success brings you a reputation."

"How do you find it today, as compared to say, two or three years ago?" was our next question.

"Oh, we still have problems. So do the molders. But we have a more satisfactory material to offer. Yes, a decidedly better



Mr. W. S. Gordon, Jr., Vice President, General Plastics Inc.

product and the industry generally has progressed tremendously. Jobs are taken today that a few years ago looked impossible from a molding standpoint."

"As to our success in meeting the demands made upon us, well, by far the larger part of our shipments today are being made in carload lots. This is the best indication of success and that our plan of large scale production was right. The acceptance of the material as meeting the requirements of both trade molder and departmental manufacturer is most gratifying to those responsible for Durez. A program which three years ago represented a cost that at the time was rather staggering for a new and small business."

Mr. Gordon brought from the center drawer of his desk a sun faded slip of paper.

"This" he said, "used to hang on the wall of our first office".

"We will do it right or bust. If we do it right the Trade will stand by us and recognize the merits of the improved product. We and they shall profit!"

"That represents our reasoning from the beginning and we continue to adhere to it. How true a prophecy it has proved to be! The General Plastics' organization realizes that it's staff should include trained men. It's accountants should be the best; it's advertising staff

experienced; it's field men must know the molding business from actual contact with molding. They must, in the language of the molding bench 'have got their hands burned'. The Durez men must be able to go into the plants and actually produce results, for their knowledge must be of molding as well as molding material".

"Your organization has devoted considerable effort, hasn't it, to develop new molding jobs? Can you tell me something about this?"

New Applications

"Yes, I can, but if you want the real story you had better wait until we visit the Advertising and Sales Promotion Department, but in a general way I may say that General Plastics foresaw that there were hundreds of opportunities ahead and decided on a definite program to develop them and our Advertising Department hasn't been asleep. It has systematically listed hundreds of items that appear to be practical molding applications and systematically studied and developed them one at a time. Of course, the work is by no means completed. New fields are being opened up continuously and all must be investigated, and while this is done with some degree of selfishness, I think we may honestly say that we have gone after this new business with the underlying

(Please turn to page 655)

Estimating In Advance The Success Of a New Style

What the Du Pont Viscoloid Company did when it decided to originate a new vogue in toiletware

As Told to Roland Cole

By Clarence F. Brown

Director of Sales, DuPont Viscoloid Co.*

THERE are recurrent periods of danger in the life of almost every kind of product when it seems to reach the peak of its vogue. Popular taste shows a restless tendency to take up with something new, buying becomes perfunctory and dealers show no enthusiasm for superficial innovations. Something radical is needed to shake up a brand-new interest in the whole market. Both consumers and dealers must be provided with new reasons for making new purchases, and hitched to that there is the still bigger and graver need that whatever is brought forth to electrify the world will live up to the promise. Not only must the new style or design be good enough to justify the hope of success, but there ought also to be some way of knowing in advance that it actually is going to be successful.

A situation like this came about in connection with Pyralin toiletware. Pyroxylin toiletware was introduced into this country in 1905. During the intervening twenty-three years, there were few fundamental changes. The *articles* comprising the usual Pyralin set have remained the same. Since the introduction of our Du Barry pattern, thirteen years ago, the *shapes* of these individual items have been all fancy and all similar. With the exception of the use of pearl, introduced in 1924, the *materials* have been much the same. Amber has been used as a base for the last ten years and as a solid material for fifteen years. And during this twenty-three-year period we have seen the greatest style changes that have ever taken place in a like period and the greatest and most revolutionary changes in our mode of

living since the present-day civilized world began.

Our business needs just one thing today—and only one—a *radical* change in style—not a minor one or several minor ones—new colors—a few new sets—but a *new vogue in toiletware*.

It is one thing to decide that a new vogue in toiletware is needed and it is entirely another actually to create that vogue. For "vogue" pre-assumes widespread public acceptance.

There is just one way to do it—find out first what the public wants, make it, then take it back to the public and prove to yourself that you have correctly interpreted their wants. That is what we started to do in February, 1927—we undertook the task of finding out what the public wants in order to re-style and create a new vogue.

A Staff of Experts

We realized that we did not have in our organization that particular type of artistic and creative and merchandising ability to do a complete styling job. So we built up a staff of experts who had these abilities and are accustomed to do such work, acting as our investigators and stylists. The work of this staff involved the creating of style ideas and checking these ideas in relation to the selling side and the production side, and, after the articles had been decided upon and made up by the factory, checking them with the consumer so that the consumer's response and acceptance could be measured and known *before the merchandise was offered for sale*.

Pages upon pages of reported interviews were compiled. We went about the stores and gath-

ered the opinions of merchandise stylists—experts sensitive to style changes and trained in style interviewing. We called upon the director of the Metropolitan Museum of Art and through his auspices we added to our staff an authority in architecture, interior decoration and period design, Mrs. Verna Cook Salomonsky, critic at the New York School of Interior Decoration, and co-author of books on antique furniture.

Among the modern influences which had their effect upon the findings of our staff were the following: The vogue for color; extreme simplicity; less useless articles; toiletware designed to harmonize with the decorative ensemble of the room will be given a continued display on the dresser top; the effect of modern art in articles of merchandise; the beauty influence in perfume bottles and toilet requisites; the vogue for decorative boxes in period design and modernistic styles; the vogue for exquisite decorative lamps and shades; the movement to use the fine arts at the Metropolitan Museum in designing articles for home use.

A New Material Developed

One of the problems encountered by our staff of experts was the development of a new material with the hard surface qualities of jet, stone and porcelain—that would conform to sharp or soft-edged shapes—that had no limitations in the way of reproducing designs, as to the amount of design area, as to the location of the design on the article, as to the character of the design—that had no limitations as to the character or number of colors used, whether the colors

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New York Office, 50 Union Square
Arthur F. Wiseburn, Manager

Ohio Representative, J. E. Black & Co.
The 4900 Euclid Bldg., Cleveland, Ohio

Detroit Office, 114 E. Lawn Ave., R. J. Scothorn, Manager

When writing the Scranton Button Co., please mention *Plastics*

used were dull, brilliant or metallic—and that designs and colors could be faithfully reproduced. This meant not only the development of a new material but a new process.

We believed, after seeing the results of our months of style, color, material, decoration and manufacturing research, that we had in our new "Lucite" line, the very thing the toileware business needed, but, we asked ourselves, were we sure? No, we decided, we were very far indeed from being sure.

So we commissioned a member of our styling department to find out. A series of meetings were arranged with representative groups of women and girls. Sets of the new "Lucite" patterns were taken to these meetings, together with sets of the most popular pearl on amber lines. Over a thousand women were interviewed, representing a cross-section of ages, classes and occupations. Among the groups to whom the new patterns were shown were college and club women, women editors of style magazines, women in art and interior decoration schools and individual groups representing average business women and average housewives. We found these women and girls keenly interested in seeing these lines and glad to record their opinions. Seven out of every ten selected a "Lucite" set as their preference, which in our opinion was evidence enough that we had created a new vogue in toileware, the success of which was assured in advance. Three out of every ten preferred a pearl or amber Pyralin set, which showed that in spite of the large preference for Lucite, there was still a worth-while market for Pyralin.

In February 1928 we called a meeting in New York of all the distributors of the Du Pont Viscoloid Company and showed them a complete display of the new line. We could truthfully say, "Lucite is not designed for the buyer of toileware—for you distributors or for your dealers. You may not like it. It is made for the ultimate consumers. And

we have proved that it is what they want."

By July, production reached the point where we were ready to supply our distributors with Lucite in quantity. Salesmen with samples of the new line, an advertising portfolio and other literature, called on distributors and began taking orders.

The first advertising announcement that our company had created this new line of toileware appeared in the September issues of a number of trade periodicals in the toilet goods, drug and department-store fields. The first advertisement is a two-page spread headed, "Du Pont announces—Lucite—a new material—a new process—new profits."

This two-page spread has on its left-hand page a reproduction, in black and white, of a four-color page advertisement which is to appear in a list of women's and class magazines, announcing Lucite to the general public. On its right-hand

page there is an illustration of three specimen mirrors of the new line, with a caption explaining that the designs shown represent "Ming," "Empire" and "Orchis" pattern of Lucite. Here is the way we are telling this, to us, very important story to our trade:

Once in a great while a new product is developed by a company with years of experience in a certain field—a product which has grown out of those years of experience and research, a product whose success is assured long before it is offered for sale.

Such a product is the new Lucite Toileware—created from a new material and with a new process (patent applied for) developed by du Pont, the makers of Pyralin, which make possible entirely new effects, new colors, new styles—creating a new vogue in toileware.

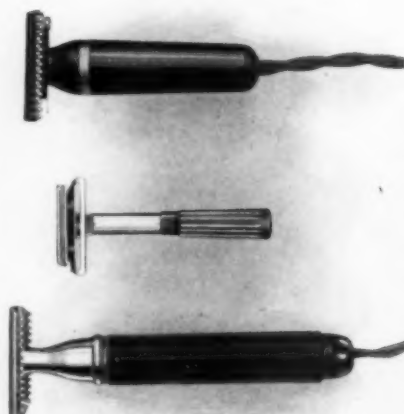
Hundreds of women of varying ages and occupations were
(Please turn to page 652)

Synthetic Resinoid Handles on New Electric Razors

ELECTRIC razor manufacturers of which there are now two, are using Durez for their molded parts. The electric razor required a material that had high electrical resistance and was impervious to deterioration by constant as well as intermittent appliances of hot water and soaps.

Additionally of course, the manufacturers wanted a material which would be pleasing in appearance. The high lustrous surface of good synthetic resinoids met this demand as well as the color possibilities. As in almost every article in use today, color seems to be an important factor.

The advantages claimed for electric razors by their manufacturers are that the user does not have to be an experienced handler of the safety or old fashioned straight blade razor, as it is not necessary to exert pressure but to merely let the hand guide the razor gently over the face,



that only a light touch is necessary, that its cutting action is the only one which is considered entirely scientific, namely a keen edge combined with exceedingly rapid action.

The motion of the vibrating blade is perpendicular and moves so rapidly that the hairs are caught erect and removed instantaneously without scraping or pulling.

A dependable, permanent source of supply



Schenectady Works

In these mighty workshops of General Electric, millions of pieces of Textolite molded have been produced. And production to-day is greater than ever before.

Here is a supply available for decades; a responsible, comprehensive organization; a reliable source of highest-grade materials.

These plants are backed by the great resources of General Electric; by the famed research laboratories; and by unexcelled facilities for service.

For complete satisfaction in the use of custom-molded parts, specify G-E Textolite molded.



Pittsfield Works



Textolite Molded

885-15

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

When writing General Electric Company, please mention *Plastics*

New British Firm to Mold Cellulose Acetate

By A. C. Blackall

British Correspondent

WITH the object of acquiring as a going concern that part of the old-established business of Greenhill & Sons, Ltd., relating to the manufacture and marketing of celluloid products and to provide the capital necessary for manufacturing on a large scale non-inflammable safety celluloid from acetate of cellulose, cellulose lacquers and cellulose brushing paints, there has just been formed in Great Britain the Acetate Products Corporation. The company has a capital of £675,000 (\$3,375,000) and the business it has acquired is one of the largest of its kind in the United Kingdom and is very well known in the celluloid industry.

The market for articles made from ordinary nitro celluloid has always been much restricted owing to the inflammable and dangerous nature of these commodities, as a result of which wholesalers and retailers restrict their stock to small quantities, ships do not carry cutlery or other articles made from inflammable celluloid, and heavy insurance premiums are imposed on its use and storage. The safety celluloid to be produced by the new corporation possesses all the advantages of durability, strength, quality and beauty of design possessed by ordinary celluloid, but unlike the latter will not discolor with age and is entirely fireproof. It is suitable for the manufacture of cutlery handles, safety glass, phonograph records, toys and dolls, collars and cuffs, combs, fountain pens, piano keys, buttons, fancy goods, lampshades, imitation tortoiseshell and ivory, sanitary toilet accessories, toilet seats, umbrella handles, etc., and, owing to the fact that it is

a non-conductor, the requirements of the electrical trade alone will, it is believed, be very large. Arrangements have already been made for supplying the requirements of an important safety glass manufacturing concern in addition to other orders and the large trade connections taken over from Greenhill & Sons, Ltd.

Cellulose lacquers and crystalline are also being manufactured in commercial quantities in the factories acquired by the company, for which there is a large and increasing demand. The lacquers are now being used by a number of the largest British automobile manufacturers.

After much research and experimental work, a cellulose brushing paint has been produced by Greenhill's. Its cost price is approximately that of ordinary good lead paint, and owing to its advantages in drying quickly and being impervious to moisture, it should supplant present paints for steamships, yachts and outdoor purposes generally, besides possessing

notable advantages for indoor work. Arrangements have been made for marketing this new product on a large scale.

The company has provided for an adequate supply of suitable acetate of cellulose for the manufacture of its safety celluloid, the raw material to be supplied at cost price plus 10 per cent under an agreement with the Cellulose Acetate Silk Co., Ltd. The latter concern can at present supply under this contract four and one-half tons daily.

Three factories are being acquired by the company at Richmond, Surrey; Leytonstone, Essex; and Slough, Buckinghamshire, together with modern plant and machinery which it is intended to employ in manufacturing acetate celluloid products. The factories will also continue to make ordinary celluloid products so far as they may be required. It is proposed to enlarge these factories at an estimated cost of £150,000 (\$750,000), and the directors anticipate that when this work has been completed in the first half of next year, the daily output capacity will be four tons of safety celluloid in addition to paints and lacquers.

The chairman of the new corporation is Morris Greenhill, well-known as chairman of Greenhill & Sons, Ltd. Charles J. Redfern is superintendent of

(Please turn to page 651)

Molded Burglar Alarm Base



THE illustration shows a burglar alarm manufactured by the Klentz Manufacturing Co., of Chicago, Ill. The base of this device was formerly made of fibre but this material required considerable machining.

One of the important changes effected in an effort to simplify the alarm was the use of Bakelite for the base. By molding the base in a two-cavity mold eight operations have been eliminated and the cost of the part was considerably reduced.

Plastics Directory, Index and Buyers' Guide 1929

Revised and Enlarged

Forms Close January 16th

Before the end of November, advertising circulars will be mailed to each of the 1928 advertisers and subscribers. This circular will be the **last** opportunity to reserve space in the Directory, and if you wish to receive it, fill out and return the attached coupon.

This Directory, the only one in the Plastic Industry, can be your strongest salesman if your firm is represented in it. Most of the preferred positions are now taken, but by replying at once you will insure a much better position than if you delay longer.

1929 Circulation (guaranteed)

3,200

PLASTICS PUBLICATIONS, INC.
114 E. 32nd St., N. Y. C.

Please send me the information about

- ☐ (a) Listings.
☐ (b) Advertising rates.
For your 1929 Directory.

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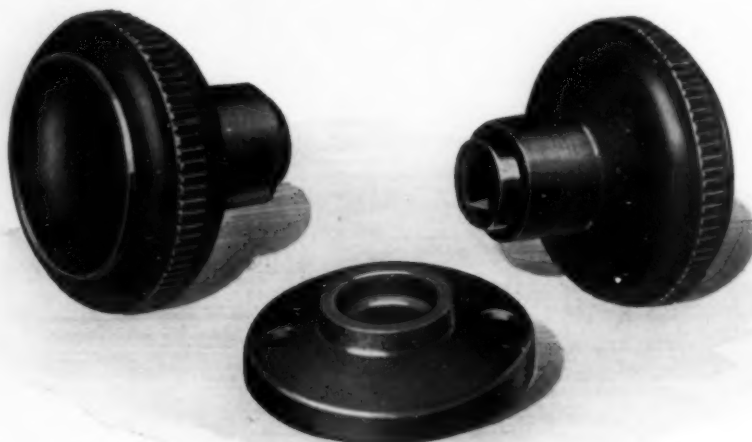
Molded Door Knobs

Synthetic resinoids prove to be very satisfactory material for door knobs and latches

FOR a long time the molding industry felt that one of the most practical applications of molded materials, but which application for some reason had not been developed, was the molded door knob.

There was never any doubt about the practicability of the application of phenolic compounds for this work. Their excellent wood color combinations, such as mahogany and walnut; the lustre or dull ebony finish which could be obtained by sand blasting the black and the many new colors that have been developed in the last few years, made the color trend in the home easy to link with the molded door knob.

One of the large manufacturers of molding compounds made molds and exhibited samples of molded door knobs through the country, while another manufacturer of molding compounds even before this time worked intensively on door knob manufacturers, who at the start of course showed the usual reluct-



ance toward adopting something new. The lock manufacturers, being equipped to handle stamped or molded metal and not molding compounds, very much questioned the practicability of having knobs made outside of their own plants and in general discouraged the application.

No definite advance was made until about a year ago when Mr. Dexter, president of the National Brass Company at Grand Rapids, Michigan, saw the possibilities and courageously took the pioneer step. They have now completely passed through the experimental stages and have recently placed on the market a complete line of Dexter latches molded of Durez, for General Plastics have proved through investigation, contacts with architects, builders, hardware dealers and home owners that the buyers were waiting for this new application of color in the home and also welcomed the other advantages made possible through the use of a plastic material.

The adaptability of phenolic molding materials through their

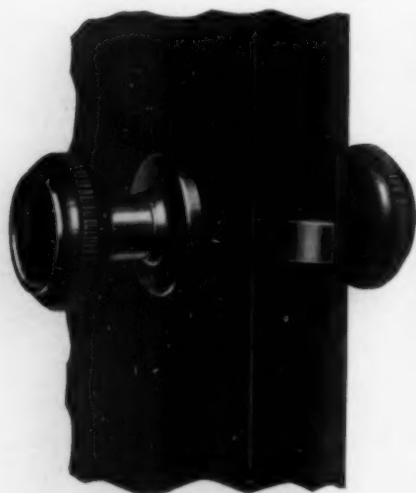
being weather proof and fire resisting, that they are not affected by perspiration or handling and that their surface coloring can not wear off, makes the material ideal for this application.

Combined with this, the National Brass latches have the additional advantage of the Dexter locking rose, an ingenious device by which the door might be locked without a key.

Duty on Certain Celluloid Toothbrushes

CERTAIN tooth-brushes, imported from Japan, where the value of the handle exceeds the value of the bristles, must pay duty at 60 per cent ad valorem under paragraph 31, Act of 1922, as celluloid articles, according to a decision just announced by the United States Customs Court. This test case was argued in the name of J. T. Steeb & Co., of Seattle. Claim was made for duty at only 45 per cent ad valorem, under paragraph 1407, Act of 1922, as toothbrushes.

In a rather lengthy opinion the Customs Court points out that where the handle is in chief value the higher rate for celluloid articles must prevail over the specific classification in paragraph 1407 for toothbrushes. Judge Sullivan writes the court's conclusions. (Protest No. 79922-G-8004).



British Industries Fair to be of Record Size Next Year

THE organizers of the Birmingham Section of the British Industries Fair have just made an important announcement as to their plans for next year's exposition. As the result of the vast extensions that are being undertaken, the Fair building will cover more than 11 acres, and the problem now facing the management is to devise a system that will indicate in a moment not only where individual stands are to be found in the miles of "streets," but the shortest cuts to them from any point. By certain structural alterations the fair and its avenues will be brought into complete alinement, lengthwise and crosswise, for its entire length of one-third of a mile by 250 feet wide. Then by means of a block system of stands, governed by numerals and letters—the former running the length of the fair and the latter across—it is claimed that it will be possible to determine at once the location of any stand. The idea of saving the time of buyers and exhibitors in this way is commendable, and yet another step in the same direction is the proposal to arrange that an office of the Export Credits Guarantee Department

shall be open at the Fair enabling those who are not yet cognizant of the advantages of the State scheme in connection with the sale of goods at the Fair to make prompt use of these facilities.

This great display of engineering, building, hardware, and similar products, with its permanent extensions every year, has come to occupy such an immense area that even regular buyers who have seen it grow mile by mile of frontage have hitherto had difficulty in deciding the shortest cuts to points they were making for. However, the new system, together with the plan to be provided in every catalog, will rectify all this next year.

More Overseas Buyers

Time economy is also the keynote of other important matters in which the management is assisting exhibitors, who are specially urged to cooperate during the preliminary stages of assembling, in order that active business may begin from the moment of opening on February 18. The Fair authorities will issue special transport labels to avoid delay, provide special forms for power supply, gas and electric light, to facilitate exact and expeditious fulfillment of requirements; unload goods of all kinds with heavy and mobile cranes of all descriptions; deliver goods at stands; remove empty cases and store them free of charge, returning them at close of Fair (100 ex-

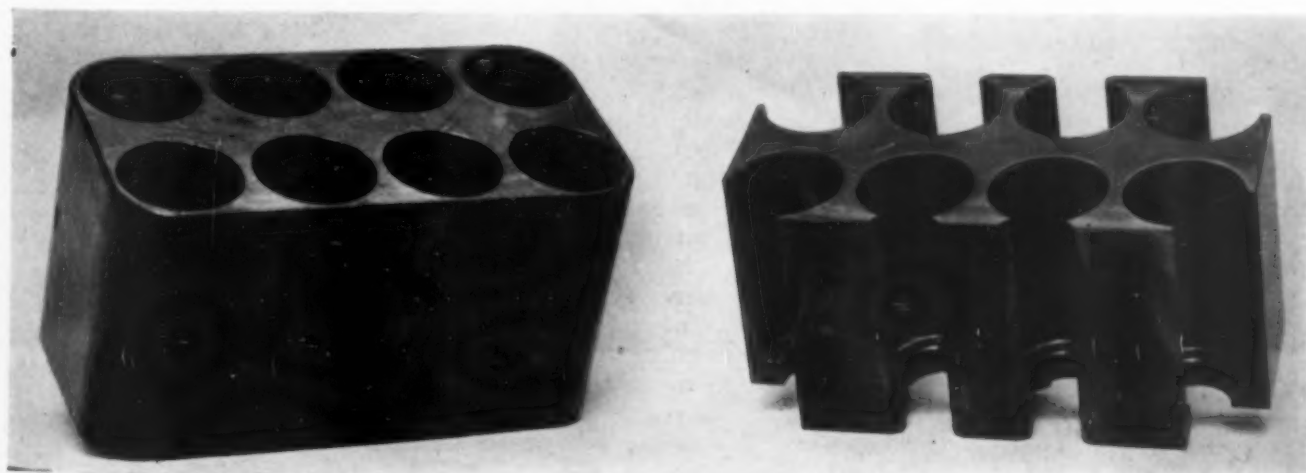
pert workers are detailed for this to ensure rapid handling and keeping gangways free); secure hotel or private accommodation, as desired, for exhibitors and buyers; issue vouchers entitling exhibitors and buyers to reduced railway fares; and provide a staff of interpreters who speak every language commonly used in world business. More overseas buyers than ever before are expected to attend next year's Fair.

Publishers Act Against "Ad" Frauds

A resolution designating the National Better Business Bureau as an agency to make an investigation of alleged fraudulent advertising and to notify the publishers and governmental agencies whenever such advertising is offered for publication, has been adopted by representative publishers of periodicals as the result of a trade practices conference held in New York by the industry.

The conference, held under the auspices of the Federal Trade Commission, W. E. Humphreys. The action of the publishers in agreeing upon a voluntary method of house cleaning, it was stated, came about as the result of efforts of Chairman Humphreys to establish a voluntary organization to protect the public from misleading advertising.

(Please turn to page 651)



Two stages in the manufacture of poker chip holder. The product is first molded as shown on left and then cut.

Micanite Replacing Indian Mica On World Market

SOME very interesting data regarding the mica industry has just been published in the annual report of the Director of the Geological Survey of India, Sir Edwin Pascoe. A member of the Survey, G. V. Hobson, while on study-leave in the United States, made inquiries regarding mica, its distribution, utilization, and consumption. He came to the conclusion that the mica broker or middleman, although necessary to the trade, was absorbing a very large portion of the profits—a proportion sometimes well over 100 per cent. This conclusion is confirmed by the surprisingly low average price obtained by the exporter of mica from India. The value of the four years 1922-25 averaged little more than one rupee (then 32 cents) per lb.

Mr. Hobson holds that the elimination of the broker is only possible in the case of very large producing and consuming firms. One American firm has achieved this result. The necessity for the broker arises from the fact that, while the producer has for sale all sizes and grades of mica, the consumer in most cases requires only one or perhaps two sizes of one particular grade. This means that the producer in order to dispose of his whole output must be in touch with consumers of all classes and must be prepared to carry heavy stocks. The producer is, in fact, very much in the hands of the broker and frequently one or more sizes or grades of mica has to accept the price the broker offers him. Any producer attempting to do without the broker with respect to one or more sizes or grades of mica runs the risk of being boycotted by the broker with respect to the rest of his material.

The complaint was made to Mr. Hobson regarding Indian mica that occasionally a few cases of an order were found to

contain mica of a different size from that ordered. The excuse made by the exporter was that owing to shortage a case or two had to be filled with under-sized mica. An examination of the consignment, however, showed a balance in favor of the exporter. Another complaint made was that Indian firms occasionally went back on their quotation, and on the receipt of a repeat order attempted to raise the price. Mica consumers do not carry very large stocks, and have no time for bargaining. Such correspondence as that indicated, therefore, usually meant a placing of the order elsewhere.

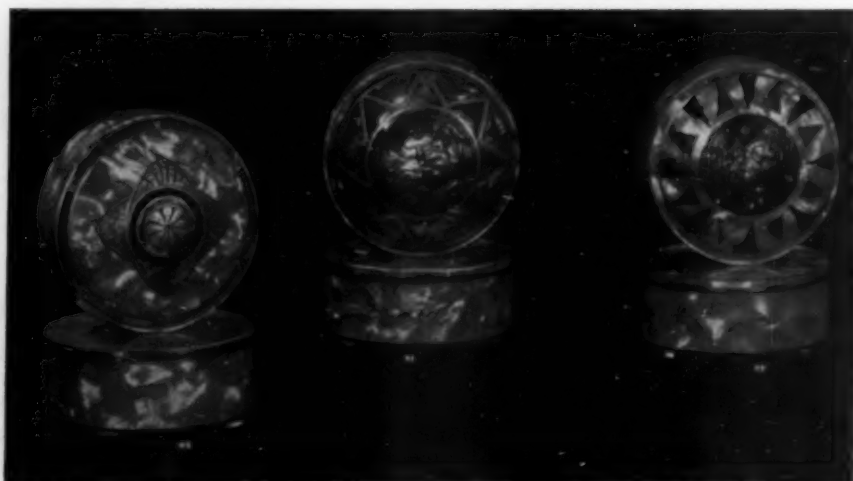
Micanite is gradually replacing mica in various uses. It is made from splittings, the production of which is at present almost a monopoly of India. In Schenectady Mr. Hobson was shown the latest development of the manufacture of micanite by modern machinery. Here mica plate was seen being made with

a new synthetic resin which may prove a serious rival to the shellac hitherto used for sizing purposes and derived from India.

The present-day tendency is toward the greater utilization of mica for almost any type of insulation problem. Micanite tape, molding micanite, flexible micanite, heat-resisting micanite, etc., can be used for such purposes, except where the insulating material has to be poured into position. Considerable efforts are now being made in South Africa and other countries to market a better dressed and graded product. Mr. Hobson points out that should this be accompanied by the training of the cheap labor available in the art of making splittings, the Indian position in the trade would to some extent be threatened.

The tendency of Indian exports in the last three years has been downwards, corresponding with the increase in the use of micanite. In 1925-26 the shipments amounted roundly to 96,500 cwt., while in the year ended March 31, 1928, the total was 82,500 cwt.

Pyroxylin Loud Speakers



A FRENCH manufacturer has produced a loud speaker whose body is made of pyroxylin. Le minilux—as this attractive style of loud speaker is called—is conveniently small, only 5½ inches in height. It is finished in mother-of-pearl and

is manufactured in a number of colored designs. This pyroxylin speaker has a delightfully clear and soft tone and is additional proof that plastic materials may well be used in speakers as well as other musical instruments.

THE manufacturers of molded products want a new name—a coined word to become identified with all molded products as “rayon” is now used to mean artificial silk.

This NEMA Name Contest offers a prize of \$250. It is sponsored by the Molded Insulation Section of the National Electrical Manufacturers Association.

The definition of the material to which the name will apply is: “Any substance composed wholly or in part of an artificial gum capable of setting into a hard, non-softening body.” Radio panels and knobs, telephone receivers, heater plugs and pipe stems are well known examples of molded products.

Names submitted should not be based on the ingredients now used as they may change as the

industry develops. They may or may not be descriptive of the properties or uses of the material. The name may even be totally unassociated with the industry.

Each contestant may submit only one name and may submit on the same sheet—if desired—an argument of not more than fifty words in its favor. Each contestant's name must be on a separate card.

Suggestions must be mailed in a sealed envelope marked “NEMA Name Contest”, addressed to the National Electrical Manufacturers Association,

420 Lexington Avenue, New York City, before midnight January 15, 1929. Results of the competition will be made public before March 15, 1929.

Rules Governing Contest For Generic Name for Molded Products

1. The definition of the material to which the name will apply is as follows:

“Any substance composed wholly or in part of an artificial gum capable of setting into a hard non-softening body.”

2. The name should not be based on the names of the ingredients now used since these may change as the art develops. It may or may not be descriptive of the properties or uses of the material. It may even be totally unassociated with the industry at present.

3. Each contestant may submit only one name and may submit on the same sheet an argument of not more than fifty words in favor of his suggested name.

4. The sealed envelope containing the contestant's offering must be marked “NEMA Name contest” and addressed to the National Electrical Manufacturers Association, 420 Lexington Avenue, New York, N. Y., will be numbered in the order they are received. The proposed name must be on a card or paper—but without contestant's name. The contestant's signature and address must be on a separate card. The sealed envelopes so received will be opened in the presence of the Contest Committee by the N. E. M. A. Statistician and the identifying number appearing on the envelope will be marked on the contestant's card and his offering without the committee members seeing the contestant's signature which will be retained by the statistician to identify the winners. The winner will be se-

The Lorgnette Returns in England

ARTIFICIAL horn-rimmed lorgnettes are coming back into fashion in England. If milady wishes to obey the mode of the moment she must appear in public accompanied by a pair of these attractive spectacles mounted on a composition handle. That lorgnettes—used as a sceptre by dignified dowagers in the spacious pre-war lays—should return to favor in 1928 is an interesting mystery. A leading London optician, however, has a theory on the subject which seems quite probable to be the real reason.

“Orders for lorgnettes have poured in during the past few weeks,” he said in an interview. “This revived fashion is part of general slowing-down tendency which is manifesting itself in every section of society.”

“In the ballroom graceful waltzes are replacing the hectic rout of Charleston and Black Bottom. Men who have worn dinner jackets at evening functions for years past now decline to appear anywhere after dark without white ties and tail coats. Woman is responding to the call of this new dignity by wearing

longer evening gowns and carrying lorgnettes. The monocle is the sign of the brilliant-minded woman and is worn in particular by those of literary pursuits.

A prominent personage who has recently taken to “horn” rimmed spectacles in England is Lloyd George. His spectacles are, however, of a distinctive type, designed to serve the double purpose of aiding both sight and oratory. Many of his friends predict that they will be snapped in two before long. They have a collapsible bridge like pince-nez, and this enables him to open and close them at will, but they are also fitted with legs. They have taken the place of the old rimmed pince-nez at the end of a black silk ribbon, along which the ex-Premier used to run his forefinger and thumb in thoughtful gesture. At a recent meeting Mr. Lloyd George fingered his new glasses so continuously and used them so vigorously to point his arguments that they were in imminent danger of destruction. But so far they have escaped accident.

EXPERIENCE



EXPERIENCE is the guide to perfection. Norton's years of experience in solving the molding problems of America's leading manufacturers assures you of perfection in every molded part. The last is like the first—identically! There is never a variation in size, color, or finish—the result of limitless experience.

Many times a molded part will actually reduce the expense of a cast part and at the same time give beauty of finish—plus strength and durability.

You are invited to submit a list of your molding requirements. We will gladly send samples of Norloc in either Bakelite or Durez.

Our Research and Engineering Departments are ready to help you solve your molding requirements. The mailing of the coupon below places you under no obligation.

NORTON LABORATORIES, Inc.

Custom Molders of Durez and Bakelite

LOCKPORT, NEW YORK

Norloc

The Trademark of Quality

Fill in and mail coupon today. We will gladly give you the story of Norton Experience and send you samples of Norloc molds without obligation.

NORTON LABORATORIES, Inc.,
Research Department,
Lockport, New York.

We would be glad to have you send us samples of molded parts for our inspection without obligation, and tell us what you have accomplished for some of America's leading manufacturers.

Name _____
Address _____
City _____ State _____

When writing Norton Laboratories, Inc., please mention *Plastics*

lected by vote of the Molded Insulation Section of the National Electrical Manufacturers Association, together with one representative of each of the four donors of the prize money, namely, Bakelite Corporation, General Plastics, Inc., Stokes and Smith Company, and Celeron Company, manufacturers respectively of Bakelite, Durez, Durite and Celeron.

5. A prize of \$250.00 will be awarded to the contestant who submits the name selected, as described in paragraph 4.

6. The prize money will be awarded in accordance with the Section vote if two or more persons submit the same name, and this name is selected as the prize winner, each person submitting the said name will be awarded the full amount of the prize tied for.

7. The Molded Insulation Section reserves the right to use, or to modify for use, any name submitted.

8. The contest closes on January 15, 1929. No names will be considered that are not post-marked in the United States of America before twelve o'clock midnight, January 15, 1929.

9. The results of the competition will be released to the press not later than March 15, 1929.

10. Check will be mailed to the winner not later than April 1, 1929.

Production of Casein in Argentine

(Continued from page 637)

cheese, and milk; whenever production of butter increases, larger quantities of by-product casein are available, but when cheese is in demand, casein production suffers and its price rises.

There is considerable discussion in the Argentine casein industry regarding the feasibility of organizing a pool for increasing the export prices because it is claimed that producers are too much under the control of the world markets. (Consul D. C. Sycks, Buenos Aires).

The Market in August

The market for this product has been very dull during

August, and few transactions were made in this commodity. Quotations for dry casein of first quality oscilated between 540 to 560 paper pesos (paper peso=\$0.42 during August) per ton. The following table shows exports by countries of destinations from August 1 to August 31, 1928.

United States	913,190
Germany	169,607
Great Britain	55,140
Spain	54,120
Finland	20,040
	<hr/> 1,212,097

(Commercial Attache Alexander V. Dye, Buenos Aires).

Publishers Act Against Ad Frauds

(Continued from page 647)

Chairman Humphreys announced that in view of the action by the periodical publishers in requesting an investigation by the Better Business Bureau no further conferences with publishers would be held.

The resolution offered by L. D. Fernald, Assistant General Manager of the Conde Nast publications, stated that the great majority of publishers had for many years on their own initiative taken measures to eliminate fraudulent advertising with the co-operation of the National Better Business Bureau, or any government agency, wherever advertising which is being published, is established by the National Better Business Bureau to be fraudulent upon reasonable investigation and notice to the person complained of.

New Acetate Products Company

(Continued from page 644)

erection and operations. He was formerly for many years with the British Xylonite Co., Ltd., and installed and operated the Nixon Nitration Works of New Jersey, one of the biggest sheet celluloid factories in America.

The present consumption of celluloid in England is about 17



Send us models, blueprints or samples

IT costs you nothing but postage to send us models or blueprints of parts you have under development—or samples of parts which are giving you trouble. And, most likely, our engineers can save you money.

Cetec parts are molded to form, and incorporate metal inserts where necessary. No machining, drilling or fitting is required. Your assembly is easier, quicker and cheaper—because each Cetec molded part is an exact duplicate of every other.

Color That is More Than Skin Deep

Cetec now comes in colors. Black and brown. Beautiful mottled effects. Color that goes clear through the molded substance—can't wear off, burn off, peel or tarnish.

Cetec is hard as rock. It has high tensile strength, transverse strength, and dielectric resistance to meet almost any need. It is practically fire proof.

We are pioneers in the molding art. Let us demonstrate Cetec before you decide your parts problems.

MOLDED **"CETEC"** PRODUCTS

CONNECTICUT

MOLDED PRODUCTS CORPORATION
MERIDEN, CONN.

When writing Connecticut Molded Products Corp., please mention *Plastics*

MANUFACTURING COMPOSITION and HARD RUBBER GOODS

Of Proven Quality
For Many Years

WE SOLICIT YOUR INQUIRY



A Novel heating plug molded in
clear detail.

KUHN & JACOB
MACHINE & TOOL CO.
TRENTON ~ ~ ~ N.J.



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When writing these advertisers please mention *Plastics*

tons daily. There are no other safety celluloid manufacturers to compare in size with the new corporation and it is thought that a large and receptive market awaits its products. The national importance of the manufacture of cellulose acetate in Britain is evidenced by the fact that it is subject to an import duty of 33 1/3 per cent under the provisions of the Safeguarding of Industries Act, 1921.

In conjunction with the flotation of this new concern a remarkably fine window display of non-inflammable safety celluloid articles was staged by Selfridge's, the famous London department store. In an interview Gordon Selfridge, chairman of Selfridge's, stated that: "The reason we are giving a special display of the goods, articles and products made out of safety non-inflammable celluloid is that we believe this is the beginning of a new and splendid industry."

Mr. Selfridge's views are supported by G. J. Keene, a director of Waring & Gillow, Ltd., London's leading furniture retailers, who states that he cannot conceive of anyone purchasing ordinary celluloid when the new non inflammable safety celluloid is obtainable. He also predicts a great future for cellulose lacquers and paints.

The Acetate Products Corporation gives as reasons for the confidence in the future of its product the fact that the Celluloid Corporation of America is making extensive plans for the manufacture of a similar product and that the du Pont Company of America is doing likewise.

Estimating Success of New Styles

(Continued from page 642)

consulted before the new Lucite patterns were finally decided upon. The trend of modern design and interior decorating was carefully studied. The new creations in Lucite are therefore made to order for the women of today—thoroughly in harmony with modern art and fashion.

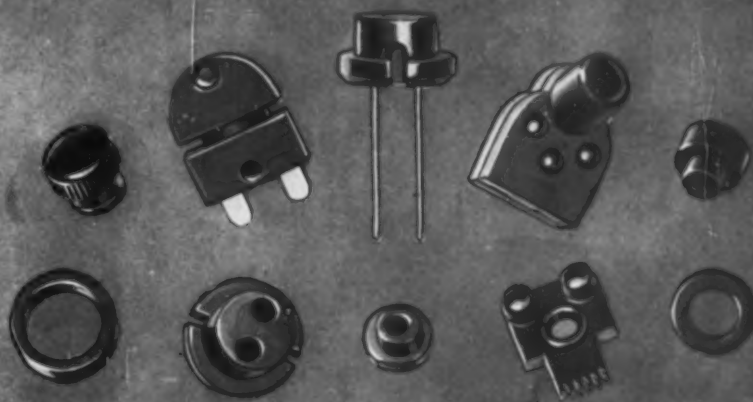
Therefore we know that this new line of boudoir accessories will open up a new market, and we are backing our judgment by carrying our story to the women of the nation. Striking full-page, four-color advertisements will tell our story to millions of readers in national magazines. A reproduction of the first of this series is shown on the opposite page.

Lucite is *style* merchandise. It is entirely new. As such, it deserves preferred position in your window and on your counters. Tie up with our advertising and make it your advertising and make your sales of toiletware this year greater than the most successful year in all your experience. Advertising material is at your disposal on request.

Lucite offers a new opportunity for profits in toiletware. Write us for complete information.

The complete campaign includes the following principal features: Page advertisements in the October and November issues of the trade publications mentioned; a series of page advertisements in color in a list of women's and class magazines during the Fall and Winter; full pages (fifteen in color, three in rotogravure) in the November 25 and December 9 issues of the Sunday magazine sections of newspapers in eighteen cities; a twenty-page portfolio, entitled "Behind the Scenes," describing the campaign in step-by-step fashion with reproductions in full color of the consumer advertisements; and a 16-page color insert for jobbers' catalogs with illustrations of the full Lucite and Pyralin lines. There is a line of dealer helps that comprises counter and window displays for displaying samples of the new line, an electric flasher display, envelope enclosures and reprints of consumer advertisements in colors; a monthly bulletin to retail clerks presenting selling ideas on Lucite; and a large Lucite Pattern and Color Chart that is intended for use behind the counter in helping retail salespeople suggest to cus-

Anything Molded of Bakelite



*A few interesting small parts
made by*

THE RECTO MANUFACTURING CO.

23 W. 3rd St.

Cincinnati, Ohio.

MOLDING



*Service for
Every Need*

NOVELTIES - MECHANICAL AND ELECTRICAL PARTS



Northern Industrial Chemical Co.
11 Elkins St. Established 1908 Boston, Mass.

When writing these advertisers please mention *Plastics*

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Say you saw it in PLASTICS

tomers the correct color and pattern of Lucite to go with the color schemes of rooms and types of decorations.

The first consumer advertisement contains the heading, "Du Pont Announces Lucite," and the subhead, "New accessories de toilette fashioned from a new material by a new process—created for the modern boudoir." To the consumer the story is presented as follows:

Now a new surface to reflect the warm glow of shaded lights, a new material in new, translucent colors which delicate craftsmanship has fashioned into all those exquisite accessories for the *toilette* which every woman must have . . . Lucite.

A new process (patent applied for) and this gleaming, delightful material make possible for the first time authentic reproductions which play a har-

monious part in the colorful *ensemble* of the modern boudoir.

Lucite accessories for the dressing table have been created by leading authorities in design and interior decoration with the co-operation of the Industrial Arts Service of the Metropolitan Museum of Art.

Lucite is on display at the leading stores the country over. By all means see it! Charming, modern, correct, yet the price is within every woman's reach.

An interesting merchandising feature in connection with the new line is its packaging. A series of gift boxes has been designed so that each color and pattern of Lucite can be displayed and sold in "sets." There are three sizes of gift boxes, a three-piece set, a six-piece set and ten-piece set. Artistically designed price tickets, matching each of the color schemes, go with each

set and gift box. The "set" plan is expected to help the retailer sell more merchandise and the "price ticket" idea, it is hoped, will be an incentive to sell Lucite at uniform prices. Moreover, carrying and selling the articles in sets should do away with the accumulation of odd pieces in retail stocks.

Another interesting feature of the Lucite line is a number of so-called "accessories." The survey made by our staff of experts revealed the fact that there is a decided vogue among women for odd pieces on the dressing-table in addition to the regular pieces. To meet this need, we have made a number of boxes to match all Lucite designs and colors, which include a beauty box, a manicure chest, a jewel case and a cigarette box. These will be sold as extras.

[BUYERS' GUIDE]

ACCUMULATORS

The Burroughs Co.
John J. Cavagnaro, Harrison, N. J.
The Dunning & Roschert Press Co. Inc.
Chas. F. Elmes Engineering Works
R. D. Wood
A. B. Farquhar

ALADDINITE

Aladdin Co.

BAKELITE

Bakelite Corporation

BLOOD

Jungmann & Co.

CAMPHOR (Synthetic)

G. B. Peters Co.

CASEIN

Jungmann & Co.
T. M. Durche
American-British Chemical Supplies, Inc.

CASEIN PLASTICS

Aladdin Co.
Karolith Corp.
Erinoid Co. of America

CELORON

Celoron Co.

CELLULOID

Celluloid Corp.

CELLULOSE ACETATE

E. W. Wiggins
American-British Chemical Supplies, Inc.

COLASTA

Colasta Co., Inc.

COTTON FLOCK

Peckham Mfg. Co.

CUSTOM MOULDERS

Connecticut Molded Products Corp., Meriden, Conn.
General Elec. Co.
Insulation Mfg. Co., Brooklyn, N. Y.
Kuhn & Jacob, Trenton, N. J.
Northern Indus. Chem. Co., Boston, Mass.
Norton Laboratories, Lockport, N. Y.
Recto Mfg. Co., Cincinnati, Ohio

Scranton Button Co., Scranton, Pa.
Shaw Insulator Co.
Siemon Co.
Jos. Stokes Rubber Co.

DIES

Standard Tool Co.

DUREZ

General Plastics Inc.

ERINOID

Erinoid Co. of America

FIBERLOID

Fiberloid Corp.

GLASS, SILVERED

Standard Mirror Co.

Tassi Bros.

GUMS

France, Campbell & Darling
Wm. H. Scheel

HEAT REGISTERING INSTRUMENTS

Cambridge Instrument Co.

HERCULITE

The Colasta Co.

HYDRAULIC EQUIPMENT

Fred S. Carver, New York City
John J. Cavagnaro, Harrison, N. J.
Evarts G. Loomis Co.
Terkelsen Machine Co.
Burroughs Co., The.
Chas. F. Elmes Engineering Works
Southwark Foundry & Mach. Co.
Dunning & Roschert Press Co.
French Oil Mill Machinery Co.

A. B. Farquhar
R. D. Wood Corp.

KAROLITH

Karolith Corp.

LABELS

Economy Ticket & Label Co.

MANICURE ARTICLES

C. J. Bates & Sons, Chester, Conn.

MEASURING MACHINES

F. J. Stokes Mach. Co.

MIRRORS

Standard Mirror Co.

Tassi Bros.

MOLDING POWDERS

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Celoron Co.
Colasta Co., Inc.
General Plastics, Inc.

PEARL COATING

Ukline Pearl Essence Co.
E. W. Wiggins

PHENOL RESINOIDS

Bakelite Corporation
General Plastics Inc.
Colasta Co., Inc.
Celoron Co.

PYROXYLIN PLASTICS

Fiberloid Corp.
Celluloid Corp.
Jos. H. Meyer Bros.
Du Pont Viscoloid Co.
E. W. Wiggins

ROLLING MACHINERY

Evarts G. Loomis Co.

SHELLAC

Wm. H. Scheel
Henry W. Peabody Co.

SWING JOINTS

Burroughs Co., The.
Evarts G. Loomis Co.
French Oil Machinery Co.
Flexo Supply Co.

TICKETS

Economy Ticket & Label Co.

TOOLS

Standard Tool Co.

TUMBLING

Rudolph R. Siebert

VARNISHES

Celoron Co.

VISCOLOID

Du Pont Viscoloid Co.

WOOD FLOUR

Acme Oil Co.
Becker Moore Co.
Burnett Co.
Jungmann & Co.

This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in PLASTICS. Please mention PLASTICS when writing to these firms.

From Drums to Carloads

(Continued from page 639)

thought of benefiting the industry as well as ourselves."

"Do you think," we asked, "that the lower price of molding materials is a good thing for the industry?"

"Yes and no" was the first and immediate reply. "No I should say unless prices are lowered on a basis of increased production and lower production costs. Fluctuating prices are a considerable handicap to the molder as he must continually revise his prices and this entails a large amount of work with no benefit to himself. If prices are reduced beyond a place where the manufacturer fails to get a fair profit the industry will become stagnant as all expenditures toward the development of new applications will necessarily have to be withheld. Yes, I am a strong advocate of prices being reduced where possible by

increased production, improved methods of production or lower raw material cost, for this will open up new applications, naturally improving the industry and make possible still further reduction in cost due to the further increase in production. We are continually striving toward improved quality and lower prices. This entails on our part continual laboratory development, the most careful plant control, rigid manufacturing economy, large scale production and the highest possible plant efficiency. The two most important factors, however, are the constant striving towards improvement in the product and the continual testing and careful control of the material through the various plant processes, so as to keep it as uniform as possible and up to the high standard of quality called for in our specifications."

The General Plastics organization has devoted extensive study to the improvement of inside molding conditions. The

interior lighting arrangement not only eases the eye strain of the men employed, but serves to give the entire plant a cleaner and more wholesome appearance. Nothing is more false than that overhead expense can be cut down by unnatural working conditions, and Mr. Tadon was justly proud of his firm's advance in the art of better lighting. One cannot visit this North Tonawanda plant, located strategically as it is, in that great fast growing Niagara-Buffalo industrial belt, without carrying away a feeling of pride for a product that has come forward to the enviable recognition that Durez has today and also some enthusiasm for its organization. A spirit of aggressiveness that no doubt is reflected from its leaders seems to prevail. The workers from the men loading cars on the siding, the young lady at the reception desk and on up to those in the swivel chairs are alert and cordial. You come away saying to yourself "a darn nice outfit".



Materials

for the Plastic Industries



LARGEST MANUFACTURERS OF

WOOD FLOUR

IN THE WORLD

Inquiries solicited

BECKER MOORE & CO.

NO. TONAWANDA, N. Y.

Cellu-Gummed Labels

That stick to Pyroxylin Plastics.

Also Regular Gummed and Ungummed Labels, printed, plain, embossed, die cut, Cardboard Tags, printed and blank.

Economy Ticket & Label Co.

552 7th Ave., New York City

Why Not Cotton Flock ?

For Use in All Classes of Plastic Composition

As a binder in composition products cotton with its longer fiber is the best procurable. Why not try it?

THE PECKHAM MFG. CO.

240 South St. Newark, N. J.

GUMS

For Moulded Composition

RESIN GUM COMPOUNDS COPAL

FRANCE, CAMPBELL & DARLING

IMPORTERS

133-37 FRONT ST. NEW YORK

Dipping Colors—Cements
for Celluloid and Pyroxylin Plastics

Pearl Essence
Lacquers



ATOM CHEMICAL CORPORATION

96 E. 10th St., New York City

Tel. Stuyvesant 7184

Manicure Steels

for mounting in handles

Nail Files

Cuticle Knives

Shoe Hooks, Pushers, etc.

Made by

C. J. BATES & SON

CHESTER, CONN.

CASEIN

DRIED BLOOD

ARE YOU INTERESTED IN
ENTERING THE

PLASTICS FIELD

IF SO, CONSULT ME FOR
INSTALLATION, FORMULAE AND METHODS

ADDRESS H. P., CARE PLASTICS

ARTIFICIAL HORN

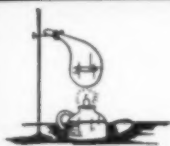
SYNTHETIC RESINS

Phenol U. S. P.
Formaldehyde
Denatured Alcohol
Methanol
Whiting

WM.S.GRAY & CO.

342 Madison Ave.
New York City

When writing these advertisers please mention *Plastics*



Materials

for the Plastics Industries



RENNET CASEIN
BLOOD ALBUMEN
Finely Powdered

Special Grades for Making
Plastics

JUNGMANN & CO.
Incorporated
5 Desbrosses St., New York

Established 1889

The Burnet Company

292 Pearl Street, New York

Telephone
Beekman 2287

Wood Flour
Phenol U. S. P.
Formaldehyde

and other raw materials used
in the manufacture of high
grade molding compounds.

Inquiries Solicited

GUMS
and
RAW MATERIALS
For Moulders of
Composition Buttons
Electrical Radio &
Record Stock

ASPHALT—Gilsonite and Powdered Asphaltum.

COMPO BLACK—

FILLERS—Aluminum Flake, China Clay, Record Black Filler, Talc, Etc.

GUMS—A most complete line of every description.

MICA—Light and Dark—Various Meshes.

WAXES—Carnauba Montan, Stearic Acid, Stearine and Powdered Wax.

Celluloid Polishes

TRIPOLI
White and Black Polishing
Compounds

WILLIAM H. SCHEEL
Importer—Manufacturer
Exporter
179 WATER ST., N. Y. C.

LABELS
BEST GUMMED LABELS

FOR PHENOL RESINS
AND PYROXYLIN
PLASTICS

ADDRESS BOX 51 PLASTICS
114 E. 32 ST., N. Y. C.

CELLULOSE
ACETATE

Casein
For All Purposes

American-British
Chemical Supplies, Inc.
15 East 26th St.
New York City

A Special
Shellac

For each requirement

Henry W. Peabody & Co.
17 State St.
New York, N. Y.

CASEIN

ALL TYPES

T. M. DUCHÉ & SONS
376 Greenwich St.
New York City

Back Numbers

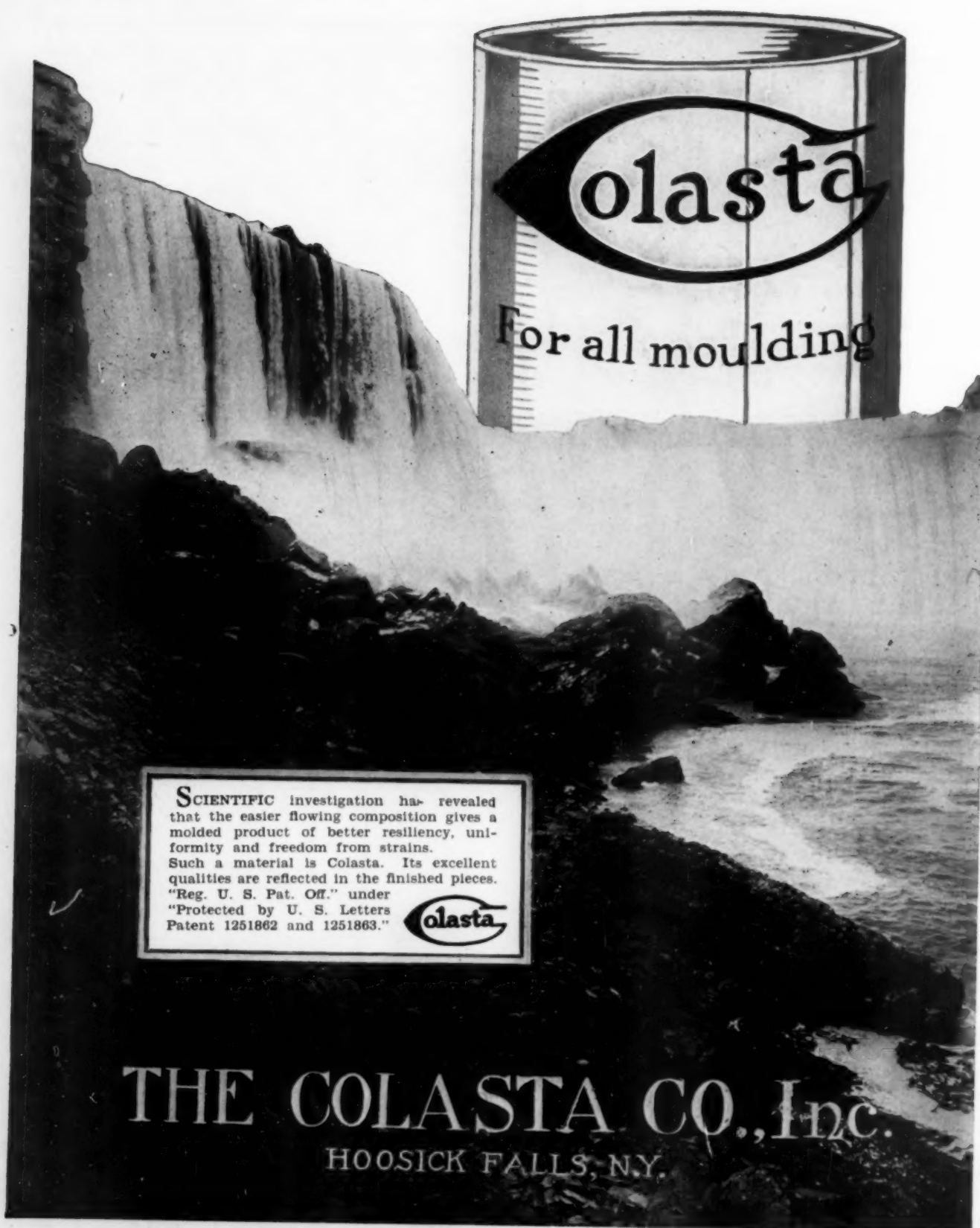
Do you require any Early Issues of *Plastics and Molded Products* to make your volumes complete?

There are still a few back numbers available for this purpose.

Orders will be filled as received until the supply is exhausted

Address Requests for Numbers
and Prices to Plastics, Box 503

When writing any of the above please mention *Plastics*



Colasta
For all moulding

✓

SCIENTIFIC investigation has revealed that the easier flowing composition gives a molded product of better resiliency, uniformity and freedom from strains. Such a material is Colasta. Its excellent qualities are reflected in the finished pieces. "Reg. U. S. Pat. Off." under "Protected by U. S. Letters Patent 1251862 and 1251863."

Colasta

THE COLASTA CO., Inc.
HOOSICK FALLS, N.Y.

When writing the Colasta Company please mention *Plastics*



Wentworth 6421

COE LABORATORIES, INC.

Merchandise Division

6033 Wentworth Ave.

CHICAGO

November 2nd, 1928.

114 East 32nd St.,
Plastic Publications, Inc.,
New York City, N. Y.

Gentlemen:

Will you please add the following names to the list of those who receive your magazine "PLASTICS" regularly? In other words, enter a year's subscription for each of the following and forward the bill for the lot to the Coe Laboratories, Inc. at the above address. Here are the names:

Dr. Geo. W. Stryker, 6033 Wentworth Ave., Chicago, Ill.

Dr. Mario Ceresini, 6033 Wentworth Ave., Chicago, Ill.

Mr. P. M. McGuire, 6033 Wentworth Ave., Chicago, Ill.

Dr. Irl L. Raiche, 6033 Wentworth Ave., Chicago, Ill.

Mr. Ernest E. Dalton, 7653 Cranston Ave., Chicago, Ill.

Start with the November issue.

Sincerely,

COE LABORATORIES, INC.

Allan D. Parsons,

ADP:VM

Advertising Manager

ERNEST MOSS

105 Green St.

Fairhaven, Mass.

September 30, 1928.

Plastics, 114 E. 32nd St., New York,
N. Y.

Gentlemen:—

My subscription to "Plastics" went in about in September 1927—much too late in life. I wish that I had a complete file to pour over from time to time. Do you think it could be had? That is—for a price that one could afford to pay for such a luxury? At least I should like very much to get the back issues for 1926 and up to Sept., 1927, and if you could supply me with those will you kindly let me know the price?

Your publication of old processes is splendid,—I want more. Couldn't you enlighten us all by publishing, now and then, articles relating to "casting,"—compositions, to be poured into molds, in a liquid state—to harden subsequently to the shape of the mold? Surely, I can't be your only subscriber interested in that branch of plastic processing?

Attentively yours,

ERNEST MOSS.

Only two out of hundreds of satisfied subscribers. One letter shows that Plastics has its place in the organization; the other shows a more personal attachment; both have "approval" written between the lines.

By entering your subscription NOW for one year at \$3.00 you will enjoy the benefits of the Plastic Directory as well as the information contained in Plastics

—And one word to prospective advertisers; a class circulation can maintain a low rate—AND SELL.



The Known

AMERITH—for	Laminated Glass
Advertising Novelties	Hair Ornaments
Automobile Curtains	Jewelry
Brushes	Optical Frames
Buttons	Toiletware
Cutlery	Umbrella Handles
Guide Cards	Wood Heels

and so on up and down the whole alphabet. Amerith in sheets, rods, and tubes, is adapted to the fabrication of many sorts of articles. It is "The Master Plastic."

The New

PROTECTOID—for innumerable uses where the qualities of celluloid are needed with the additional requirement of being slow burning. Where its variety of colors—in embossed, silk, and modernistic designs—will stimulate new sales in old markets. Lamp Shades, for example. Protectoid is a new plastic material made in clear transparent, opaque and mottled colors. Send for samples, stating what you make.

(Consult our technical staff freely on any questions as to the use and handling of plastic materials. Our fifty years experience is yours, if you will but ask for it.)

CELLULOID CORPORATION

58 West 40th Street, New York City

Chicago
36 S. State St.

San Francisco
340 Sansome St.

St. Louis
Arcade Bldg.

Boston
52 Chauncey St.

Factories—Newark, N. J.